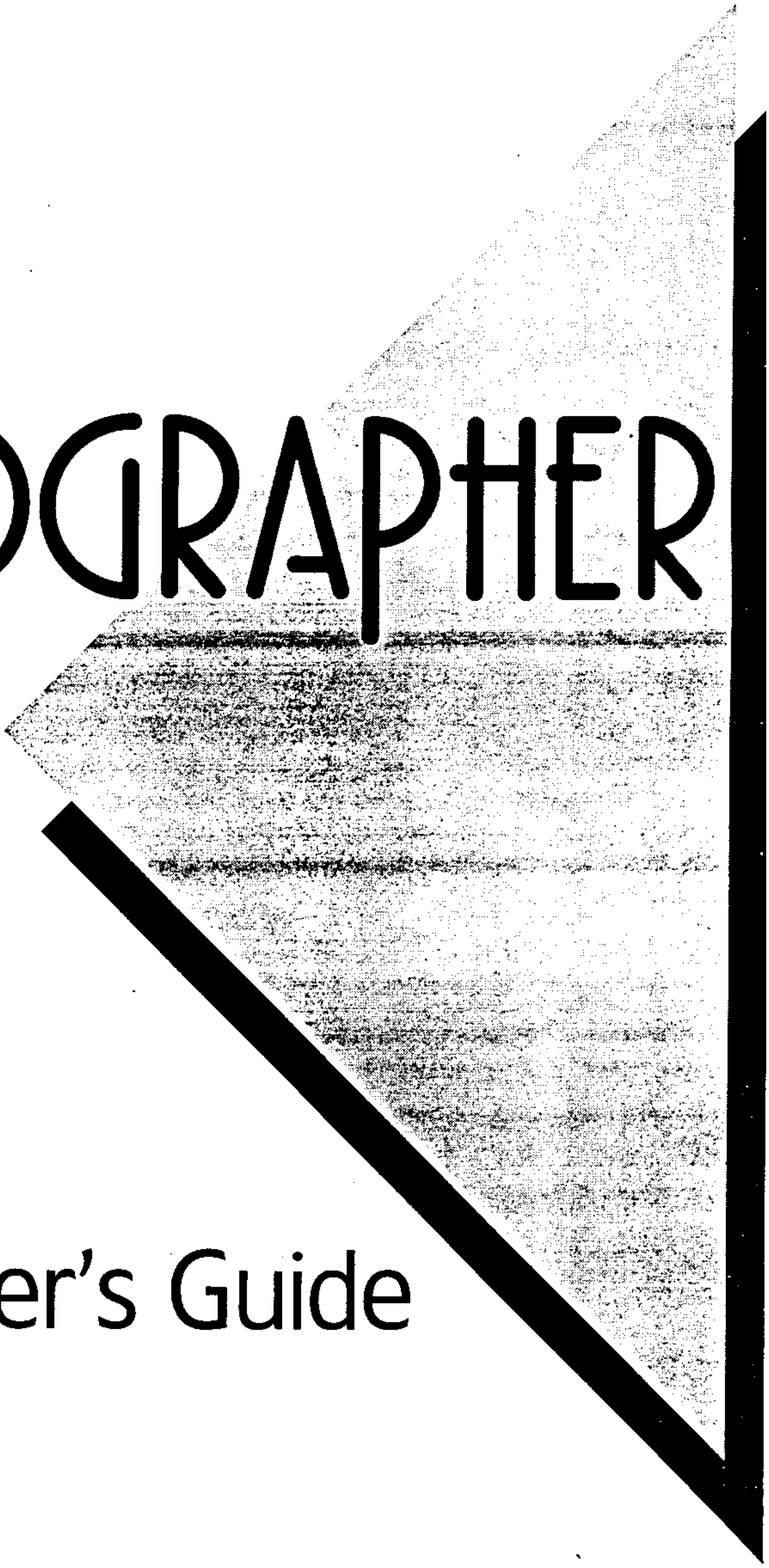
ALTSYS

FONTOGRAPHER



User's Guide

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FONTOGRAPHER

Credits

Fontographer version 3.1 was written and developed by Jim Von Ehr, Parry Kejriwal, David Spells, David Fung, James Brasure, and Eon Chang. Special thanks to Kevin Crowder.

This manual was written by Katharine Green with editing (and a lot of help) from Earl Allen and Pete Mason. Special thanks to Kent Dowden and George Sullivan, Jr.

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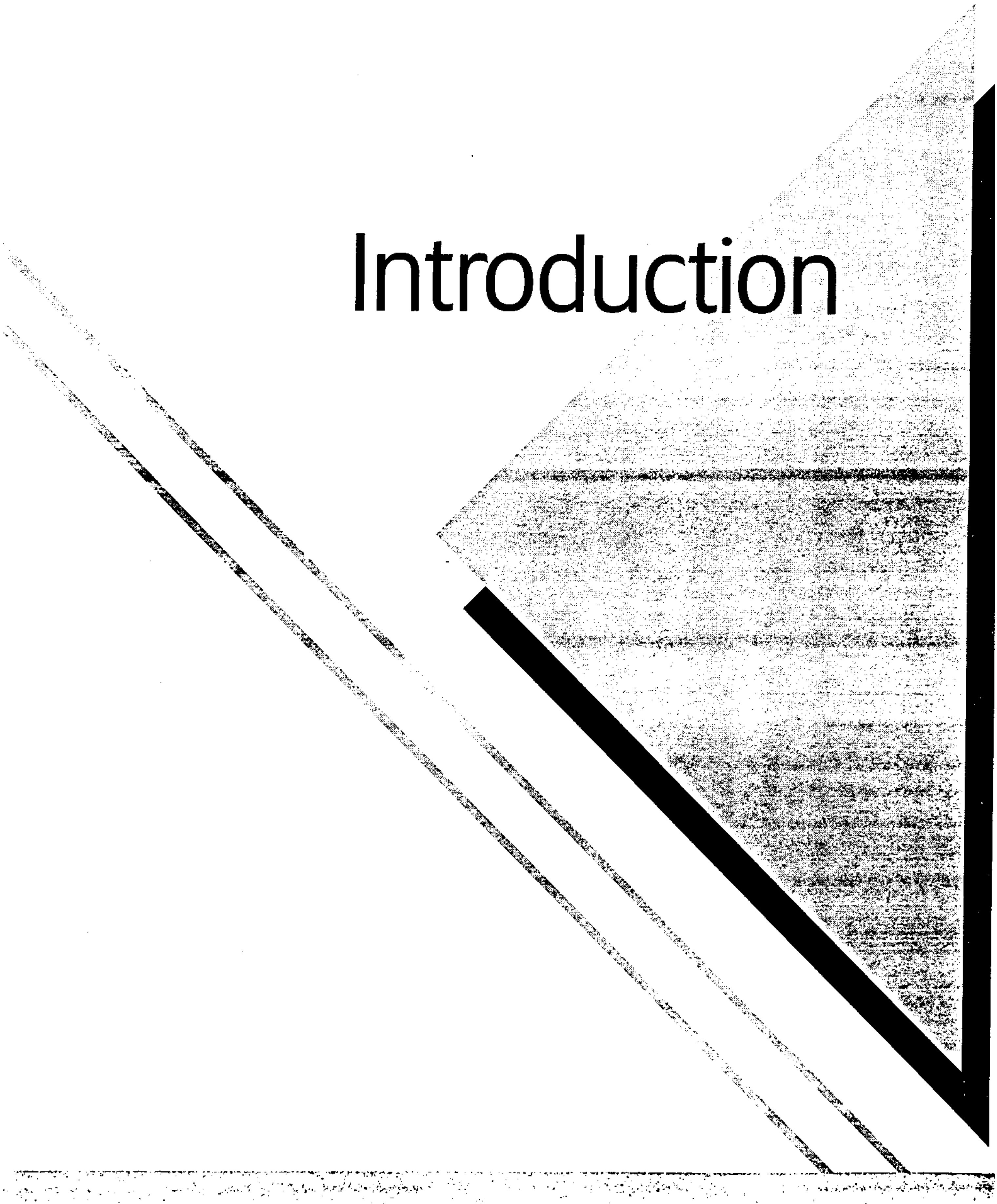
Introduction



Introducing Fontographer

Welcome to Fontographer® 3.3 !

Since its introduction in 1986, Fontographer has been the standard for professional typeface and logo design on the Macintosh. Typography once meant the process of printing written words through the use of metal types. With the advent of computers, typography became attainable to everyone: from the graphic illustrator—to the desktop publisher—to the business executive. Before Fontographer, typed images could only be produced by using complex, expensive, and time-consuming procedures. Now, Fontographer provides this capability to the world of computers, and more personally, to you.

Fontographer 3.3 allows you to generate ATM-compatible Type 1 PostScript fonts as well as Type 3 fonts and Encapsulated PostScript (EPS) files. Additionally, you can import kerning tables from Adobe Font Metrics (AFM) and bitmap font files. You can also take advantage of the PostScript graphics you created in Aldus FreeHand and Adobe Illustrator by pasting them directly into your characters.

So whether you are a novice or an experienced graphic designer, Fontographer allows you to assign your characters and graphic images to any key or combination of keys, and gives you the added ability to instantly repeat and resize these images in any application.

Fontographer makes it easy to create new typefaces or add your logo to existing typefaces. Using Fontographer's drawing tools, you can create a professional-quality PostScript character in minutes and print that character on a LaserWriter or any PostScript compatible printer. Now, with Fontographer and your Macintosh, you can create designs that rival those produced by professional typographers.

What should I do first?

If you are a "first-time" user, the best way to start learning Fontographer is to use the tutorial "Fontographer, The ABCs." This tutorial is designed to introduce you to Fontographer's basics: the character, the character edit window, the drawing tools, and basic printing techniques. Once you have completed the tutorial and its exercises, refer to Fontographer's *User's Guide* for information that will help you plan and create your font.

The *User's Guide* and the tutorial assume that you are familiar with the Macintosh and that you have used other Macintosh applications. You should be familiar with basics such as using the mouse, choosing items from menus, and working with documents. If you need more information on these topics, refer to your Macintosh owner's manual.

The *User's Guide* contains fifteen chapters, plus appendices, a glossary and an index. The *User's Guide* is divided into four sections:

- **Section One** contains information about the font, from opening a font, to printing your font.

- **Section Two** contains information about Fontographer's three windows: the character edit window, the metrics window, and the bitmap window. We give step-by-step instructions for each of the tasks you normally perform with Fontographer.

- **Section Three** contains information about creating composite fonts, characters, and parts libraries. These chapters are advanced; you should be familiar with the first two sections of this manual before proceeding to this section.

- Section Four contains important background information, a reference section which describes each of Fontographer's windows and menus, and a short chapter on Fontographer Preferences and hints.

Before you begin

What do I need to get started?

Before you can actually start using Fontographer, you need to check to make sure your package is complete. Your package should include two diskettes. They are:

Fontographer's "Program Disk" and "Tools & Utilities Disk."

Make sure that you have everything you need in order to use Fontographer. You must have a Macintosh Plus (or higher) computer with at least 1 Mb of RAM. An external disk drive or hard disk is highly recommended. If you want to make high resolution hard copies of the characters you create, you will also need a PostScript compatible printer such as the Apple LaserWriter.

Fontographer can be run on a single drive system (with some inconvenience), a two drive system, or a system with a hard disk.

Read me...

All Altsys release and update disks contain a TeachText document titled ReadMe. It contains information about the product which may not be present in the *User's Guide*. You should read this file before attempting to use the program.

Register for technical support

To become a registered user and receive technical support, you must complete and return the registration card included in this package.

Altsys believes in customer support, and wants to resolve any problems you have.

Our support lines are available Monday through Friday from 9:00 AM to 5:00 PM Central Time. Our support phone number is (214) 680-2093. Please have your serial number on-hand when you call. You serial number is located on the back of the "Program Disk."

The remainder of this chapter tells you how to begin using Fontographer.

Backup your Fontographer diskettes

Before you do anything else, turn your diskette over so the back side faces you and push the black tab up so you can see through the write-protect opening. This will prevent you from accidentally erasing any information while you make backup copies. You should immediately make a copy of the Fontographer master disks for a backup copy.

Find two blank diskettes. Copy Fontographer's "Program Disk" onto one diskette by dragging its icon onto the blank disk's icon. Click "OK" and change the disk if requested. Repeat this procedure for Fontographer's "Tools & Utilities" disk. You should now use these new disks and store the original Fontographer disks in a safe place.

Getting started

When you are ready to begin, follow these steps to start Fontographer:

- Turn the computer on and insert a system disk into one of your disk drives. The System file on the disk you use must be version 4.2 or later, and the Finder must be version 6.0 or later.

- Insert the Fontographer disk into the other drive.

- If needed, open the window for the Fontographer disk.

- Start Fontographer by selecting its icon and choosing Open from the File menu (or simply by double-clicking its icon).

Note: If you have a hard disk, make a Finder copy of the program "Fontographer" and run from the copy on your hard disk. Fontographer is not "copy-protected."

Section One

All About Fonts

Chapter One

Opening Fonts *(existing and new)*

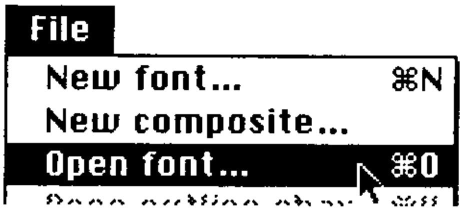
Opening a font

There are two ways to open an existing font.

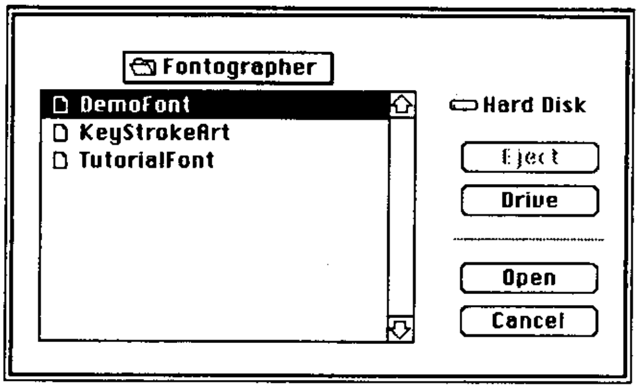
- Double-click on the font file from the desktop. This starts Fontographer and opens that file for editing.

OR

- While Fontographer is running, choose "Open font..." from the File menu.



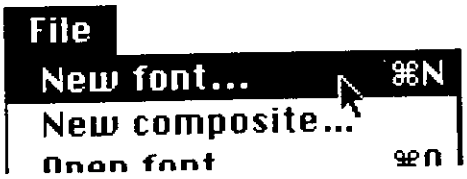
This presents the standard file selection dialog, which allows you to choose a font file. The file selection dialog works in the standard fashion, so you can change drives, eject disks, open a file, or cancel.



Once the selection dialog is open, you can select a font file for editing by clicking on its name and then "Open," or simply by double-clicking on its name. A maximum of ten fonts can be open at one time.

Creating a new font

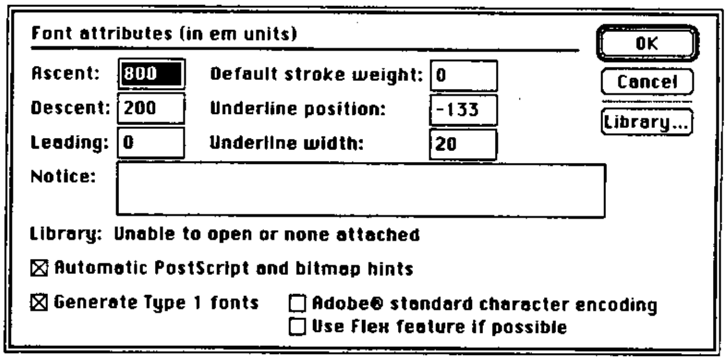
A new font may be created by selecting "New font..." from the File menu or typing ⌘N.



Setting font attributes

Before creating a new font, it is important to decide on the relative proportions of items such as the character's ascent and descent. These may be changed during editing, but it is best to specify the font attributes at the start.

Refer to the "Font attributes" dialog box below as you go through this section. The first thing Fontographer asks for when defining a new font is the general characteristics of the font.



Font attributes (in em units)

Ascent: 800
Descent: 200
Leading: 0
Default stroke weight: 0
Underline position: -133
Underline width: 20
Notice:
Library: Unable to open or none attached

☒ Automatic PostScript and bitmap hints
☒ Generate Type 1 fonts
☐ Adobe® standard character encoding
☐ Use Flex feature if possible

Font attributes are characteristics which apply to the font as a whole. They are initially specified when defining a new font. We recommend that you make any changes to the font attributes *before* you create a new font. However, these characteristics may be changed at any time by choosing "Font attributes..." from the Edit menu. This is the same display that is shown when a new font is created.

To change font attributes:

- Change any value by selecting that field with the mouse, then type in the new value(s).

  The Tab key can be used to skip to and select the next field.

- After you have made your changes, click "OK" to save all the changes, or "Cancel" to ignore changes.

Note: A standard ascent of 800 and descent of 200 is recommended unless you have a good reason to use other values.

What makes up the font attributes?

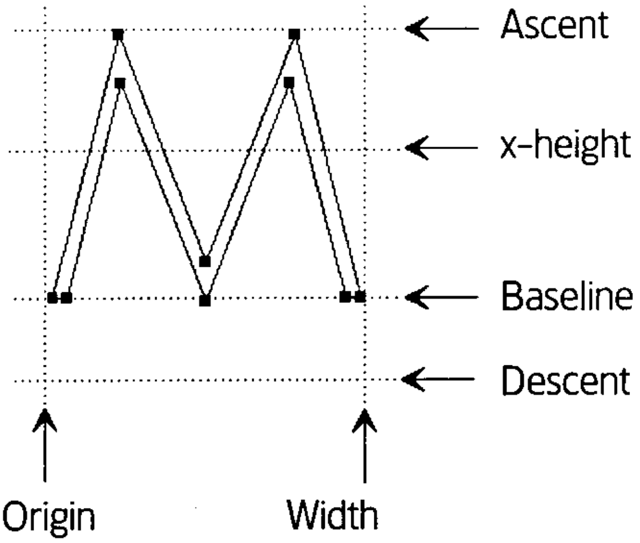
Em-square

Each character is described in terms of a rectangle called an *em-square*. The em-square is the outer square around the letter. This square is so named because it is nominally as wide and the same height as the letter "M." The em-square is used as a normalization value when generating PostScript and also defines the precision possible in the font.

The total font height or em-square is determined by the distance between the ascent and descent. All fonts are normalized inside the LaserWriter or any other PostScript printer, so that, in the printer, their em-square is one point (approximately 1/72 inch) high.

Defining a font in this fashion allows a single outline to be scaled to any size requested. Think of em-units as relative co-ordinates rather than a specific physical distance. Larger em-squares give more precision for drawing characters but do not make larger characters or more precise PostScript output.

Refer to the figure below as you follow this overview.



Ascent

The *ascent* line marks the top of the capital letters. An ascent guideline is automatically drawn (in the outline window) at the top vertical position specified when the font is created and may be changed with the "Font attributes..." command in the Edit menu. Characters should not normally extend above the ascent line. Any character which extends above the ascent line or below the descent line will have its bitmap representation vertically scaled to fit between the ascent and descent.

Descent

The *descent* line marks the lowest point of the descenders of such letters as "g" or "y." Fontographer automatically places a descent guideline (in the edit window) at the lower vertical position specified when the font is created. This may be changed by changing the descent with the "Font attributes..." command under the Edit menu. Characters should not drop below the descent line or they may interfere with characters on the next line. Sometimes, however, this is a desired effect, such as instances when vertical bars must connect from one line to another (i.e., borders). Dropping the bar slightly below the baseline guarantees that it will connect with the next line, even if numerical round-off pulls two lines slightly further apart than the normal spacing.

Ascent and *descent* control the size of the em-square in which characters are drawn. Fontographer's default values are: ascent 800; descent 200. You may change these proportions as needed. The default values provide a 1,000-unit high em-square, which is the same resolution used by the standard built-in printer fonts such as Times-Roman and Helvetica. A 1,000-unit em-square is accurate enough for most work, but extremely fine details printed on a high-resolution typesetting machine can sometimes benefit from increased resolution. Fontographer allows an em-square of up to 8,000- units, which is far more resolution than any current output device can take advantage of. We recommend a maximum em-square of 2,048 or less. Em-squares larger than 1,600 will require more memory in your printer.

Note: For Nimbus Q hinting of bitmaps, an em-square of 2,048 or less is necessary.

x-height

The *x-height* marks the top of lower case letters such as "x" and "o." It may be positioned anywhere, since it is only a guideline. Faces with taller x-heights are generally perceived as larger and more readable than those with smaller x-heights.

Origin

The *origin* of the em-square is always at a vertical location of zero. This is where the "drawing pen" which paints the character is positioned at the start of drawing the character.

Baseline

The *baseline* is the line upon which capital letters sit. When printing mixed fonts on a line, all baselines line up with one another. The baseline position does not need to be explicitly specified, since it is always at a horizontal location of zero. The dot at the intersection of the origin line and baseline is the *basepoint*. This is used as a reference point for position measurements or as an aid to line up points. When you open a new character edit window (or display a new character in an existing window), the basepoint is positioned at location 0,0—at the origin of the em-square.

Leading

Leading (pronounced "ledding") is the space between the descent line of one line of text and the ascent line of the next line down the page. It thus specifies how much space there is between lines. The term leading comes from earlier days when thin lead strips were inserted between lines of text to provide line-to-line spacing. Currently, leading is specified only in the Macintosh screen (bitmap) font; this controls the spacing on the printer. Some applications ignore this leading value. Leading size is not used directly by a PostScript font but is used by Fontographer when calculating the default leading for bitmap generation.

Width

Width is a moveable vertical line which specifies the width of each character. When drawing characters on a page, the origin line of the next character is placed on top of the width line of the current character. Widths may be zero, but, due to the way bitmap fonts are defined, can not be negative.

Default stroke weight

Default stroke weight specifies the default stroke width to be used for stroked characters. Zero causes the stroke width to be drawn as a hairline (the narrowest line the printer is capable of printing). A normal value would be 50 units, but this may be changed to give any stroke width you desire.

Note: You may override this value on a character-by-character basis, so different characters can have different stroke widths. But if you override values on a character by character basis, those characters will not use the default stroke width.

Underline position and underline width

Underline position and *Underline width* allow precise specification of the vertical position and width of the underline in underlined text. This position is measured in em-units.

Library

You can open or change *Libraries* from the "Font attributes" dialog box. When no libraries are open or attached, the library field will read "Unable to open or none attached." Chapter Twelve explains libraries in more detail.

Notice

The *Notice* field is used to specify copyright notices or any other textual information you wish to appear in the PostScript preamble for the font. Simply type any line of text into the text box; this text is automatically copied into the font header each time the font is generated.

Automatic PostScript and bitmap hints

The *Automatic PostScript and bitmap hints* box is used to set better quality PostScript and bitmap fonts. Chapter Fifteen explains hints in more detail. Applying hints to a font generates higher quality fonts, especially at smaller point sizes.

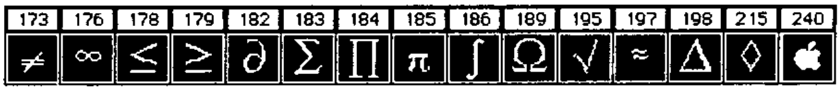
Generate Type 1 fonts

The *Generate Type 1* fonts option (which has two sub-options) gives you the ability to generate Type 1 fonts. Type 1 fonts print much better and work with Adobe Type Manager. Chapter Thirteen explains Type 1 in more detail.

Adobe® standard character encoding

PostScript fonts use a flexible encoding scheme by which character codes select character descriptions. The association between character codes and descriptions is made by a separate "encoding vector."

There are two standard types of encoding vectors: Apple and Adobe. Fontographer allows you to select either one. The two vectors differ and lead to different character sets. There are 15 Symbol font characters in the Apple encoding which do not exist in the Adobe encoding: notequal, infinity, lessequal, greaterequal, partialdiff, summation, product, pi, integral, Omega, radical, approxequal, Delta, lozenge, and apple. The character slots below show these characters.

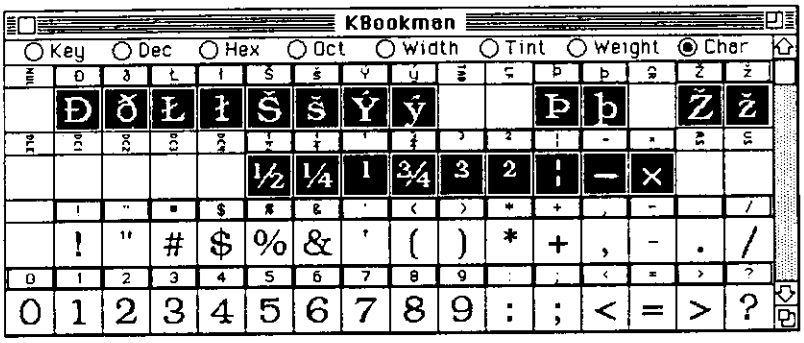


173	176	178	179	182	183	184	185	186	189	195	197	198	215	240
≠	∞	≤	≥	∂	∑	∏	π	∫	Ω	√	≈	∆	◊	

When the Adobe encoding box is checked, the Symbol font characters will be substituted for these characters when you use the Apple print driver (LaserPrep) for printing.

We recommend that you do not use the Adobe encoding option unless you wish to use the font on non-Macintosh systems and understand these issues completely. For further details, refer to Adobe's *PostScript Language Reference Manual.*

There are now 21 new characters at the beginning of all fonts. The font window below shows these characters selected. The new characters are Eth, eth, Lslash, lslash, Scaron, scaron, Yacute, yacute, Thorn, thorn, Zcaron, zcaron, onehalf, onequarter, onesuperior, threequarters, threesuperior, twosuperior, brokenbar, minus, and multiply. Some fonts may not have all these characters defined. The highlighted character slots in the font window below show these characters.



Note: If you change the encoding and regenerate a Type 1 font from an existing Type 3 font file, you must regenerate, then remove and reinstall the bitmaps. If you do not do this, the last 128 characters of the font will be incorrect.

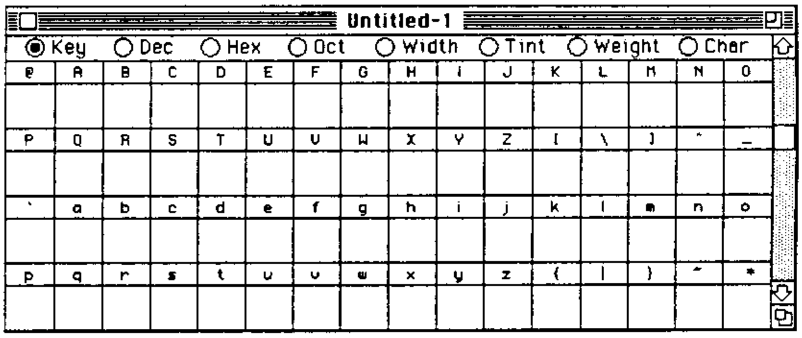
Use Flex feature if possible

The purpose of the Flex feature is to eliminate slight indentations in the font's outline at small sizes while still keeping those same indentations at larger sizes. If the Flex box is checked, Fontographer applies subtle effects to cupped serifs and tapered stems. Garamond is a good example of a font that would need Flex to properly render its serifs.

Note: Flex will increase the size of your font. Don't check this option unless your font meets the Flex requirements.

The window of a new font

Once the font attributes have been selected, the font window opens. If you are creating a new font, the window's title bar reads "Untitled-1." Each new font you open will have "Untitled" as a name and the next consecutive number (Untitled-1, Untitled-2, and so on). Until you save your font, the window will remain untitled. There are no characters defined in the font window below, so the character boxes are blank.


Untitled-1
@ A B C D E F G H I J K L M N O
P Q R S T U V W X Y Z [\ ] ^ _
` a b c d e f g h i j k l m n o
p q r s t u v w x y z { | } ~ *

● Key ○ Dec ○ Hex ○ Oct ○ Width ○ Tint ○ Weight ○ Char

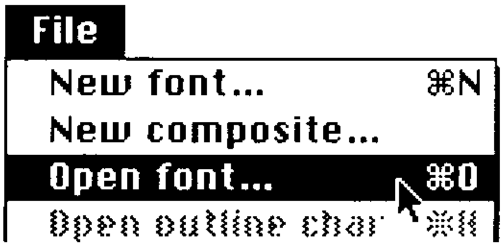
Chapter Two

The Font Window

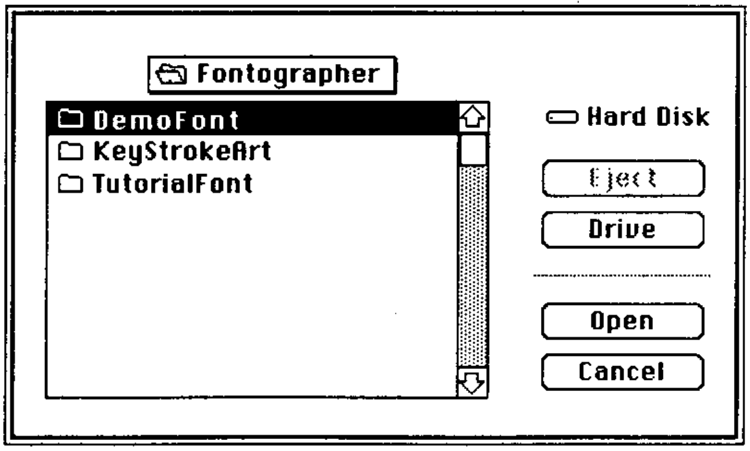
Opening a font

To open an existing font:

- Choose "Open font..." from the File menu or type ⌘O.



This presents a standard file selection dialog, which allows you to choose a font file. The file selection dialog works in the standard fashion, so you can change drives, eject disks, or open a file.

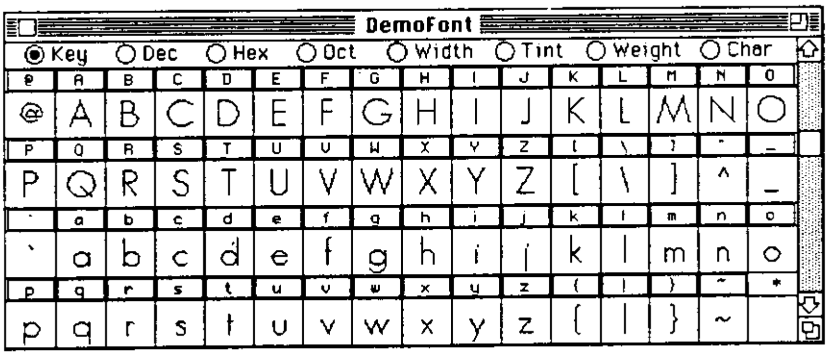


Once the selection dialog is open, you can select a Fontographer font file or Type 1 PostScript file for editing by clicking on its name and clicking the "Open" button or by simply double-clicking on its name.

Note: Having the associated bitmap font file in the same folder as the outline font file will automatically open the bitmap font file.

The font window

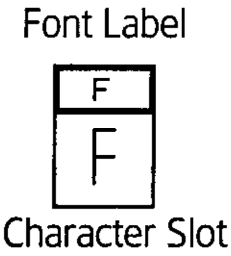
When you open a font, Fontographer displays a window which describes that font. This window shows a box for every character in the font and may be scrolled to show a different range of characters. The ***font window*** has a title bar (which displays the name of the font being edited), zoom button, close box, size box, and scroll bar just like the standard Macintosh window.



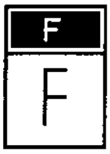
@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	*
p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	

Just below the title bar is a set of eight buttons (radio buttons) which you can set to control the information presented within the font window. These radio buttons are covered in more detail later in this chapter in the section "Display Options." Like any other window, the font window can be moved (by dragging its title bar) or closed (by clicking on its close box). However, in order to assure that necessary information remains visible, the window will not reduce to less than the current horizontal size.

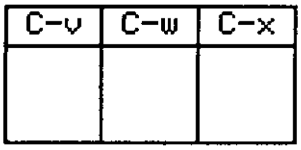
Each font is composed of 256 ***character slots***, each of which corresponds to a character that can be typed from the keyboard. A slot can contain a character, a logo, or any other graphic image. The contents of a slot are highlighted whenever the corresponding key is typed while the font window is open.



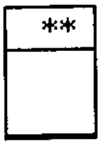
The remainder of the font window shows some portion of the character slots within the font. The scroll bar is used to select the particular range of slots which are visible. The lower portion of a slot always shows a 24 point bitmap of the character contained in that slot, while the ***font label*** (the upper portion) displays a code which represents the character. In addition, the upper portion has a bold border if the character has been defined (contains an image) and is highlighted if the slot has been edited since the font was opened or last saved.



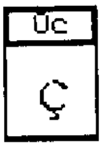
Highlighted character label
(edited since the font was opened or last saved)



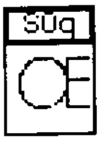
Prior to the character slots that contain alphabetical images are character slots that contain the "Control" characters. They correspond to your keyboard's control keys and always begin with "C-." These characters cannot be accessed from non-ADB (Apple Desktop Bus) keyboards. ADB keyboards can access these characters by holding down the Control key and typing the letter that follows the "C-."



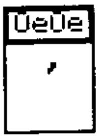
Character slots that are labelled with an "* *" cannot be accessed from the keyboard.



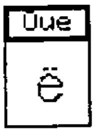
Directly after the character slots which contain the alphabetic images are character slots that contain the "Option" and "Shift-Option" keys. They correspond to your keyboard's Shift and Option keys and always begin with the letter "O" or "SO." They can be used to store additional characters and symbols as we have done here. In our first example, the keyboard command is "Option-c."



In this example, the keyboard command is "Shift-Option-q."



This example is somewhat different. It indicates that you enter "Option e" on the keyboard twice to access the character.



This example indicates that you enter "Option u" and then type "e."

Selecting characters

You may select either a single character or a range of characters. A single character may be selected either by clicking on its slot with the mouse or by typing it on the keyboard. Typing a key on the keyboard when the font window is active causes the corresponding character box to become highlighted. The display scrolls automatically to show the typed character if it is not already in the visible area.

- **Click on the slot containing the "C." Notice that the entry is now highlighted.**

- **Type "A" on the keyboard. The "C" becomes deselected and the "A" becomes selected.**

  A range of characters is selected by positioning the pointer on one end of the range, pressing and holding the mouse-button, dragging the pointer to the other end of the range, then releasing the button.

- **Position the pointer on the slot containing the "A."**

- **Press and hold the mouse button while you drag the pointer to the slot containing the "Z" and then release.**

  The characters between "A" and "Z" will be selected.

  If you want to change the extent of a selection without starting over *(while your characters are still selected)*, press the Shift key before pressing the mouse button to deselect the character(s) or to select more characters.

To select discontiguous (non-adjacent) characters:

- Select a character, then press and hold the Shift key down before clicking on the remaining characters.

For example: If you wish to select the characters "A" and "P:"

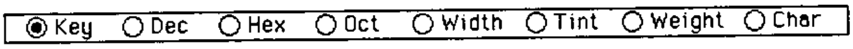
- Click on the "A."
- Hold down the Shift key and click on the "P."

Selecting characters using arrow keys:

- Use the left-right arrow keys to select the next and previous characters in the font window.
- Use the up-down arrow keys to select the character in the previous or next row from the selected character.

Display options

Radio buttons control the information that is presented in the character label. By default, the Key button has been selected.



● Key ○ Dec ○ Hex ○ Oct ○ Width ○ Tint ○ Weight ○ Char

The *Key* button corresponds to the *keyboard* sequence used to enter the character.

The *Dec* button shows the *decimal* value of the ASCII sequence character code number.

The ***Hex*** button displays the character code numbers in ***hexadecimal*** (base 16).

The ***Oct*** button displays the character code numbers in ***octal*** (base 8).

The ***Width*** button displays the ***width*** of each character in em-units. Characters which have not been defined in the font will display "**" in the character label.

The ***Tint*** button displays the gray ***fill*** percentage of each character. If the label displays "0," the character is white. If the label displays "100," the character is black. If a character has no fill, the font label displays an "N." Characters which have not been defined (do not exist) in the font will display "**" in the character label. Composite characters can have more than one gray fill, so they display a "C."

The ***Weight*** button displays the stroke ***weight*** of the character. Composite characters will display a "C." Characters with no stroke width (for example a solid filled character) would display a "N." An "**" would be displayed for characters which have not been defined.

The ***Char*** button shows the system ***character*** corresponding to each slot in the font window.

Select whichever "Display option" format you prefer. Each time you save the font, Fontographer remembers the current setting and uses it in subsequent sessions.

Applying effects

Fontographer has the ability to modify character images to produce interesting special effects. These effects may be used from either the font or the character edit windows. When used from the font window, an effect is applied to all points in each of the selected characters (this may include the entire font).

You can copy an image (or part of an image) from one character to other characters from the font window.

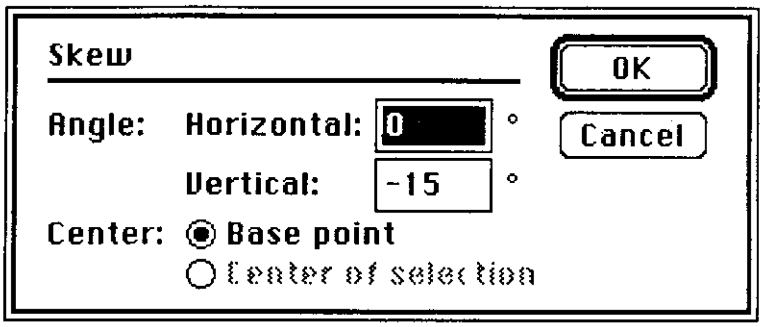
Additionally, effects such as scaling, rotating, skewing, moving, flipping, setting width, and setting the character's fill or tint can be applied to more than one character from the font window. In short, while you are in the font window, any effect that you apply to a single character may also be applied to a range of characters.

For example, vertical skewing may be used to create italics. Skewing is specified as horizontal and vertical angles. Italics are normally skewed vertically by -15 degrees.

To skew multiple characters:

- Select the characters you wish to skew.
- Choose "Skew" from the Special menu.

  Fontographer's "Skew" dialog box will appear.



Skew

Angle: Horizontal: 0 °

Vertical: -15 °

Center: ● Base point

○ Center of selection

- Click "OK."

  All selected characters will be skewed.

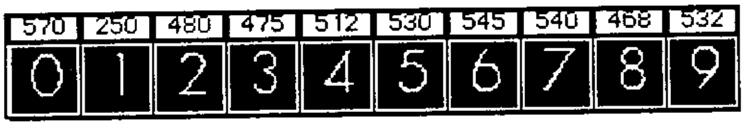
If you are creating a monospaced font similar to Courier, it is necessary to set uniform character widths. Doing this from each character window would be tedious as well as time consuming. By choosing "Set width..." in the Special menu, you can set all selected character widths at once from the "Width" dialog box.

PER DEFINIRE LA GRANDEZZA DI UNO, MOLTI
o TUTTI I CARATTERI

To set character widths for one, several, or all characters:

We have selected the numbers 0-9. By selecting the "Width" radio button, we can see that the em-units are not uniform. We would like our numbers to be monospaced, with all of their widths a uniform 570 em-units.

- Select the character(s) you wish to change.



570	250	480	475	512	530	545	540	468	532
0	1	2	3	4	5	6	7	8	9

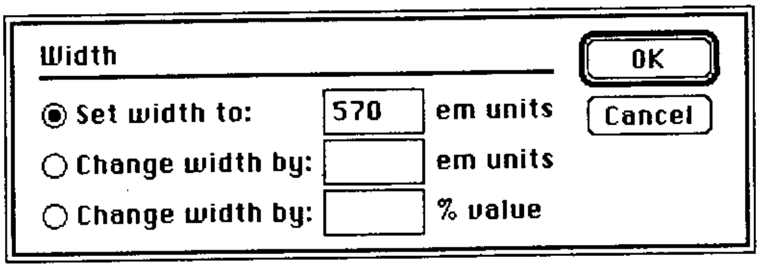
Fontographer's keyboard command to select all characters is the standard "⌘A."

- To select discontiguous characters: Click on the first character slot, and press and hold the Shift key down before clicking on the remaining characters.

- Choose "Set width..." from the Special menu.

Fontographer's "Width" dialog box will appear.

- Enter "570" and click "OK."



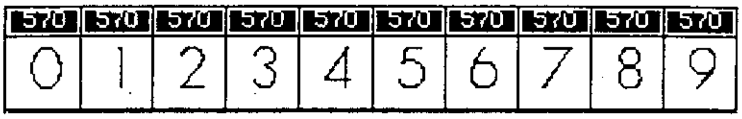
Width

● Set width to: 570 em units

○ Change width by: em units

○ Change width by: % value

Fontographer will set the width of the selected characters.



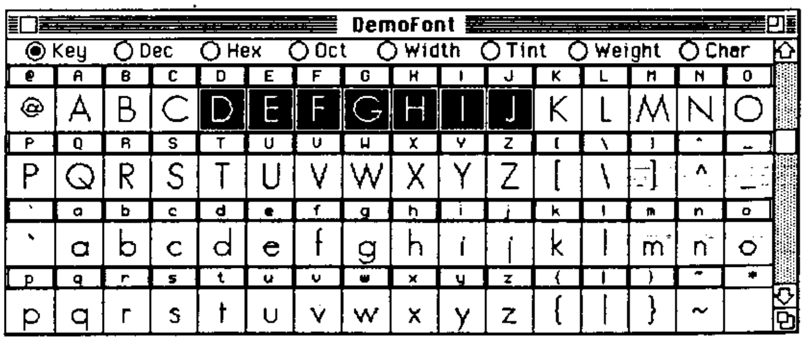
We have just finished changing the widths.

To copy characters between fonts:

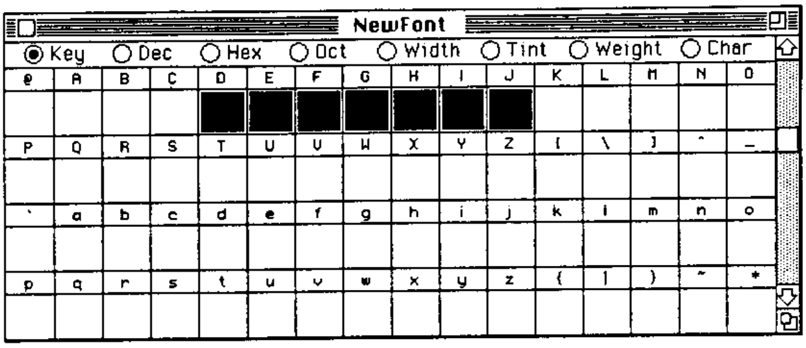
If you are creating a new font that uses some of the character images present in an existing font, the job will be simplified by opening windows to both fonts. You can then simply "Copy" ranges of characters from the existing font and "Paste" them into the new one. This is especially useful if there are several disjoint ranges that need to be copied. Libraries, which are covered in Chapter 12, can also be used for this purpose.

- **Open both the font window containing the characters you wish to copy and the font window where you will paste those characters.**

- **Select the character range to be copied.**


DemoFont
● Key ○ Dec ○ Hex ○ Oct ○ Width ○ Tint ○ Weight ○ Char
@ A B C D E F G H I J K L M N O
P Q R S T U V W X Y Z [\ ] ^ _
` a b c d e f g h i j k l m n o
p q r s t u v w x y z { | } ~

- Choose "Copy" from the Edit menu.


NewFont
● Key ○ Dec ○ Hex ○ Oct ○ Width ○ Tint ○ Weight ○ Char
@ A B C D E F G H I J K L M N O
P Q R S T U V W X Y Z [\ ] ^ _
` a b c d e f g h i j k l m n o
p q r s t u v w x y z { | } ~

- Select the character range to be pasted.
- Choose "Paste" from the Edit menu.

Fontographer copies the characters into your new font window.

Regenerating changed characters

PostScript and bitmap files must be regenerated if any characters are changed in the font window. Generating fonts is covered in Chapter Four.

Opening windows

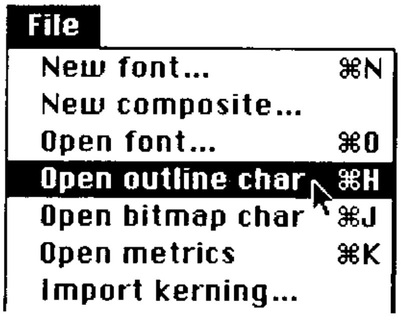
The font window is the first thing you'll see when you open a font. This window is the central point around which all your other actions revolve. From this window, it is possible to open the character window, the metrics window, and the bitmap window. Fontographer allows you to open up to 30 windows at once.

To open an outline character window:

- Double-click on the selected character.

OR

- Select the character and type " ⌘H."



OR

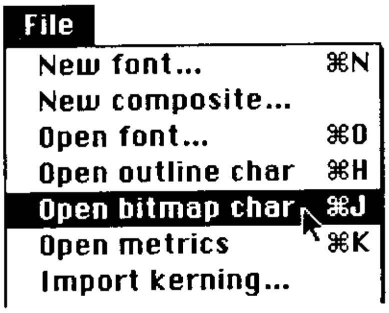
- Select the character and press the Return or Enter key.

To open a bitmap character window:

- Press and hold down the Option key while you double-click on the desired character.

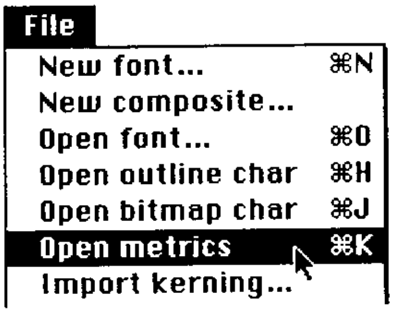
OR

- Select the character and type " ⌘J."



To open a metrics window:

- Select the character and type " ⌘K."

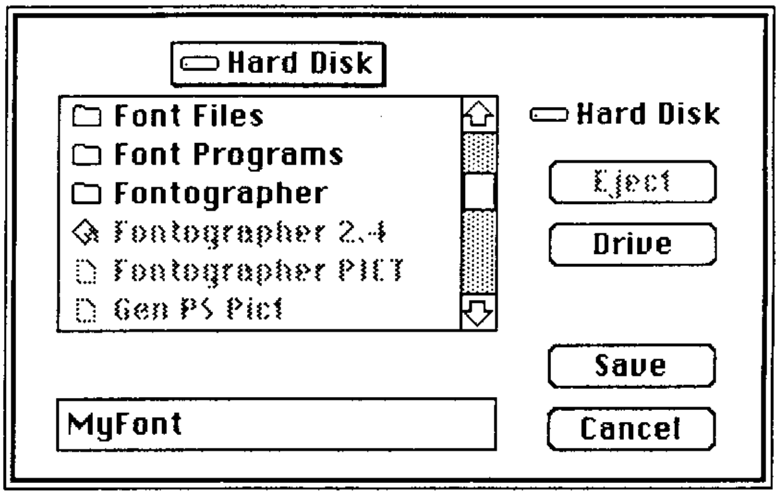


The outline character window, metrics window, and bitmap character window are explained in detail in Chapters Seven, Eight, and Nine respectively.

Chapter Three

Saving Fonts

You can save fonts via the "Save" or "Save as..." commands in the File menu. The standard Macintosh file saving dialog appears, allowing you to specify the file name, change drives or folders, eject disks, or cancel the operation.



MyFont

The "Save" and "Save as..." commands work from any of Fontographer's windows.

The "Save" command saves any changes back to the file you originally opened. If you create a new font, "Save" offers the opportunity to choose a font name.

The "Save as..." command allows you to save the active font window under a new font name. It is important to choose a name which conforms to the naming conventions described on the next page.

The "Quit" command offers the option of saving or discarding your changes before quitting, just in case you haven't saved your changes.

Naming a font

The Macintosh Print Manager abbreviates PostScript font names according to a complex naming convention. Therefore, outline font file names must be chosen according to certain rules.

Fontographer's naming rules:

- Outline font names must start with a capital letter but should not be entirely capitalized.
- No spaces or special characters should be used inside a name.
- Periods are acceptable, but they are stripped off along with anything after the period, during PostScript and Bitmap file generation.
- Outline font names must be at least six characters long.
- When PostScript abbreviates a name, each capitalized name component is treated as a separate component. The first five characters of the first part, then the first three characters of each following part are connected together to construct the abbreviated PostScript font file name. Such abbreviated names must be distinct from the Fontographer font file name. Thus, "ThisIsBad" is unacceptable because the constructed PostScript font file name is also "ThisIsBad." The name "ThisIsGood" is fine because the constructed name is "ThisIsGoo" (each component after the first component uses at most three letters of the base name).

- If you must have a short name like "A," put a suffix on its outline font file name—for example, "A.font." The abbreviated PostScript font file name is then "A," the bitmap file name is "A.bmap," and the bitmap font name in the font menus is "A."
- The total length of the abbreviated file name must be less than 32 characters. This may limit the number of components used in a name.
- Fontographer checks and gives an error message for bad names.

Examples of good and bad font names:

Outline	**Abbreviation**	**Bitmap**
A	**A**	**A**
Bad—outline name is too short and conflicts with abbreviation		
A.font	**A**	**A**
Good—no conflicts		
ACAPFONT	**ACAPFONT**	**ACAPFONT**
Bad—name is all caps and conflicts with abbreviation		
AGoodName	**AGooNam**	**AGoodName**
Good—no conflicts		
ABadOne	**ABadOne**	**ABadOne**
Bad—name conflicts with abbreviation		
Very Bad	**(error)**	**Very**
Bad—has a blank which causes PostScript errors		
Mine12.font	**Mine**	**Mine12**
Poor—numbers are allowed, but can be confused with point size		
Not$Good	**(error)**	**Not$Good**
Bad—has special characters		

Examples of names (and icons) Fontographer generates:

PostScript font file (Type 3)

DemoFon

Outline

DemoFont

PostScript font file (Type 1)

DemoFon

EPS File

DemoFont.art

PostScript-Absolute
PostScript-Compressed
PostScriptPC and Other

DemoFon

Bitmap

DemoFont.bmap

BDF

DemF.24

AFM

DemoFont.AFM

Note: Since the PostScript-Absolute, Compressed, and PC and other files all have the same icon and name, you must rename the file or place it in a different folder before each generate operation or they will be replaced.

Renaming

Fontographer fonts may be renamed by opening the original file and then doing a "Save As...."

After renaming a font or doing a "Save As...," the PostScript font must be regenerated before the font can be used. This is necessary in order to place the new name into the PostScript code. Regenerating via Fontographer is the only practical way to change the names inside the PostScript fonts.

After changing the name, be sure to use the Font/DA Mover to remove the old screen font from your System file before installing the new one. If you don't remove the old screen font, there will be an ID conflict and the new font will be silently renumbered.

Preferences

Fontographer Prefs

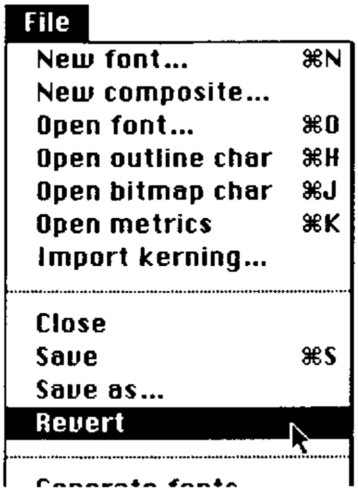
Fontographer automatically places a preferences file in the System Folder. The file is named "Fontographer Prefs." This file is responsible for saving information about Fontographer's character window position, size, and type (outline character, bitmap, or metric). With the preferences file in your System Folder, it is possible to open an existing font with the same number of open windows, set at the same size, and in the same position as the last font you saved. Chapter Fifteen covers Fontographer Preferences in detail.

PostScript files

In user-defined PostScript files (for Print Sample), the name of the current edit font has always been "TestFont." With the advent of Type 1 fonts, containing the Adobe encoding vector, this no longer suffices. You should change user-defined PostScript file's font names from "TestFont" to "|______TestFont" (vertical bar, six underscores, then TestFont). This will pick up the Macintosh-encoded version of the font, which will support printing of the European accent characters.

Reverting

The "Revert" command takes you back to the last saved version of an entire font. You will be asked to confirm this operation since Fontographer throws away any changes made since you last saved the font. You can only "Revert" from the font window.



A new font can't be reverted since there is no saved font to revert back to.

Chapter Four

Generating Fonts

After you design the font, it is time to generate fonts. This is necessary because fonts are shared resources in your computer and are stored in a special way.

There are two parts to a font: the bitmap font file for the screen display, and the PostScript font file for the printer.

Both of these files have to be specially installed. But first, let's explain the reason behind generating and installing bitmaps.

There is a special folder in your Macintosh computer, known as the System Folder. This folder typically contains shared resources like print drivers, desk accessories, and fonts. The file known as the "System" is also in this folder. The bitmap fonts have to be installed into this System file, so that they will appear in the font menus of all your applications.

The standard way to install these bitmap fonts is with the Font/DA Mover. When you install your bitmap fonts, you are placing NFNT and FOND resources into your System. The NFNT is the font resource which contains the image of your bitmap. There is one NFNT for each point size. The System automatically scales the screen display to compensate for any point sizes you ask for which are not present.

The FOND resource contains information about the font family: the names of the family's PostScript font files, and references to all the NFNTs in the family, width tables, kerning tables, and other related information.

The second half of the installation process is to generate the PostScript font file. This file contains the PostScript language which commands the printer to draw your characters. Since PostScript is resolution-independent, you can print with resolutions ranging from 300 dots per inch (dpi) on a printer like a LaserWriter, all the way to 2540 dpi on a typesetter like the Linotronic 300.

Why generate fonts?

How bitmap and printer fonts work together

The name of the printer font file is stored in the bitmap font's FOND resource, thus linking the bitmap font to its corresponding PostScript printer font file. Whenever you print a document, the Macintosh looks into the bitmap font's FOND resource and finds the name of the corresponding printer font file. It then looks in the System Folder for that file and, if it finds the file, downloads it into the printer. If the Macintosh cannot find the printer font file, it will send the bitmap images of the characters to the printer, resulting in jagged-looking printing.

The illustration below shows the difference between bitmap and PostScript fonts.

Bitmapped font

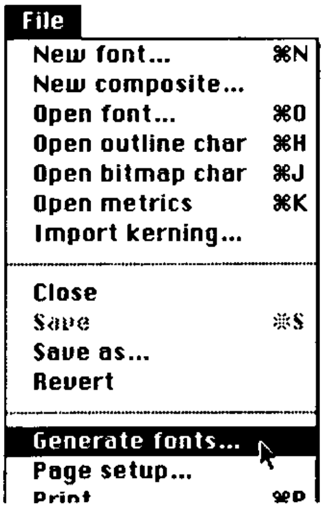
PostScript font

When do you generate fonts?

When you finish creating or changing your font, and are ready to use it in your applications, it is time to generate the font. You must now generate both a PostScript font for the printer and a bitmap font that will be used for your screen display. It is important that you remember to regenerate your font when you make changes, not just after you create a new font.

To generate fonts:

- Choose "Generate fonts..." from the File menu.



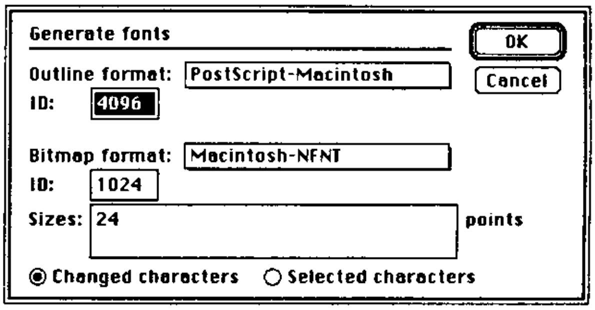
Fontographer's "Generate fonts" dialog box will appear. It is possible to generate different kinds of fonts from this box. The dialog box allows you the option of generating both PostScript and bitmap files at once, or each file individually.

To cancel font generation:

You can stop the font generation (bitmap and/or PostScript) process at any time by typing ⌘ and a period.

To choose "Generate" formats:

- Position the pointer on the "Outline" or "Bitmap" pop-up menus, and press and hold the mouse button while you drag the pointer to the option of choice.



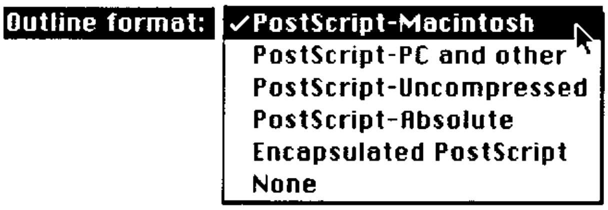
Generate fonts

Outline format: PostScript-Macintosh
ID: 4096

Bitmap format: Macintosh-NFNT
ID: 1024
Sizes: 24 points

● Changed characters ○ Selected characters

Outline format



PostScript-Macintosh

Choosing this option generates the standard PostScript font file. This is the normal selection. This font file can be used for both automatically downloadable fonts or fonts that are to be downloaded to the printer's hard disk. It is in this format that PostScript and the Apple print driver recognize the file as a Macintosh font.

The characters generated in this file are in the compressed format. Compressed PostScript is the preferred form for generating fonts. PostScript is stored very inefficiently inside the printer, so compression is necessary to pack as much information into the memory as possible. Fontographer's compression scheme generates fonts which take up one-fifth the space, on the average, of uncompressed fonts. The compressed form is generated as a string of numbers and letters which requires the font header to decipher. Even with this compression, it is only possible to fit three to five fonts into the LaserWriter. One other side benefit of compressed fonts is that the restriction on the total number of points is eliminated (normally only about 50 to 100 control points may be drawn per character before a PostScript printer's memory overflows).

PostScript-PC and other

Choosing this option generates the font file as an ASCII text file. The font file is also compressed. This option may be used for transferring Fontographer-generated fonts to non-Macintosh systems.

Note: Installing and moving the font file to the PC is left up to the user. At this time, Altsys does not have any utility to assist in this process. However, you can use the Apple File Exchange program to format a 3 1/2" PC diskette and transfer your file to it.

PostScript-Uncompressed

This option is provided for custom PostScript programming. It generates an ASCII text file with the standard PostScript definitions of the character. You may use this option to get the PostScript definitions for all the characters in the font. Under certain circumstances it may be appropriate to generate a small font in uncompressed format when the number of characters is small and the font must print as fast as possible.

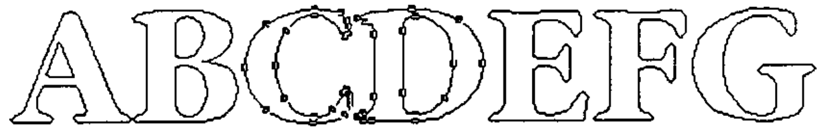
PostScript-Absolute

This option is provided for anyone wanting to have absolute coordinates in their PostScript files; for example, people using sign cutting systems or doing custom PostScript programming.

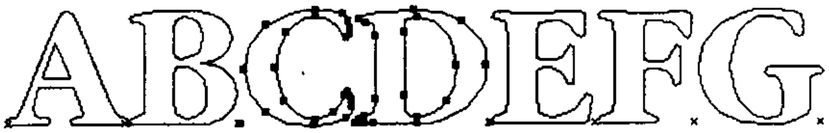
Encapsulated PostScript

This option is provided for those who wish to generate Abode Illustrator 1.1-style EPS (Encapsulated PostScript) format files. EPS (sometimes known as EPSF) is the file format originally developed by Altsys Corporation. EPS files may contain a PICT (bitmap) representation along with the PostScript description of a picture. Programs such as Aldus FreeHand and Adobe Illustrator can read this file format directly for editing purposes. The name given to this file is the font name suffixed with "art." For example, an EPS-generated GoudyOldstyle font will be named GoudyOldstyle.art.

Choosing the Encapsulated PostScript option allows you to turn your font into a graphic. You can apply all the features of Aldus FreeHand and Adobe Illustrator to your characters. You can add or delete points, reshape or distort, change the stroke weight, or fill the characters with a specific color or pattern. You can even alter a character's shape to create swash caps. Then, you could import it into The Art Importer. Your artwork now becomes a font which can be used in any application with a font menu—and even retains the color information for color separations!



This illustration shows a Type 1 font that was generated in EPS format and then opened using Aldus FreeHand. The points and BCPs can all be activated (like the "C" and "D") and are ready for use. All the functionality of FreeHand can be applied to your outlines.



This illustration shows a converted font that was generated in EPS format and then opened using Adobe Illustrator. All the functionality of Illustrator can be applied to your outlines. We selected the "C" and "D," so their points are active. An additional benefit of using the EPS format in Illustrator is the small x's that appear between the characters. These x's allow you to line up the letters to comply with their original origin and width point markers.

Note: If you generate a font with the "Selected characters" option checked, the only characters in your EPS file will be those you specifically selected for generation.

None

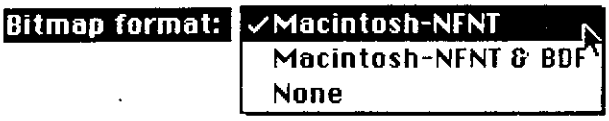
This option is provided so you can regenerate the bitmaps without having to regenerate the PostScript. This saves time, particularly in those cases where minor changes are made to the bitmap characters or you just want to add new point sizes.

Note: Be sure to regenerate PostScript if any changes are made to the character. (For example, character width, fills, outlines, etc.)

The PostScript ID Field

Type 1 fonts use this information, so if you are generating Type 1 fonts you must set the PostScript ID field properly. Font IDs for new fonts are automatically generated in the range 4,000,000 to 4,999,998. If you are a commercial font developer, you should contact Adobe Systems, Inc. (415-961-4400) for an allocated font ID. This ID is used for caching the bitmaps in your printer. This can speed up printing. The PostScript ID Field is optional. If you do not want your font to have a unique PostScript ID, set this item to 0 and Fontographer won't put a unique ID in your font.

Bitmap generation



Macintosh-NFNT

Fontographer automatically generates bitmap fonts and the resources that go with them. You can generate various point sizes at any time. Since these are standard Macintosh bitmap fonts, they are limited to sizes between 1 and 256 points. The generated fonts can be installed into the System file by the Font/DA Mover.

Larger sized fonts can take up a large amount of memory in your system. Currently, the size limit is 256K per point size. Larger sized fonts can give better WYSIWYG (what you see, is what you get) results, but at the price of less available memory for your applications.

The width of a bitmap character is limited to 254 points on the Macintosh. At the larger point sizes, this may require you to limit the width of an outline character. Fontographer avoids trouble by automatically limiting wide bitmap characters to 254 points, even if the character is calculated to be wider.

Note: Certain applications may not recognize or display fonts larger than 127 points. Keep in mind that large point sizes can take up a lot of memory and disk space.

Macintosh-NFNT & BDF

This option is provided to generate Adobe Bitmap Distribution Format (BDF) files in text format, and can be used for creating screen fonts on some other computer systems, such as the NeXT and the PC. Information on the format of the BDF file can be found on CompuServe. GO APVENB and choose Data Library 3. The file you should download is named BDF.SIT.

None

This option is provided to disable bitmap generation. In the instances where simple changes have been made to the outline font (like adjusting a BCP, which does not affect the bitmap), it is not necessary to regenerate the font.

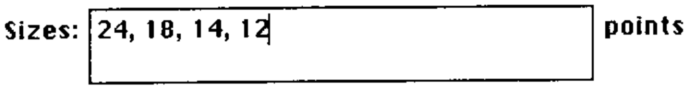
Adding bitmap sizes

Fontographer automatically generates a 24-point bitmap font.

To add point sizes:

- Choose "Generate fonts..." from the File menu.
- Select an Outline format of "None."
- Choose a Bitmap format of "Macintosh-NFNT."

- Type the desired point sizes in the "Sizes" field and click "OK."



Sizes: 24, 18, 14, 12 points

Adding a new size will automatically generate all the characters for the newly added size.

Deleting bitmap sizes

Unwanted bitmap sizes can be removed from the bitmap file by removing the size from the "Sizes" field. Fontographer will display a warning message before it deletes the fonts. The deleted point sizes will be removed from the bitmap file the next time you "Save" the font. To remove the 24 point size, use the Font/DA Mover.

Bitmap cleanup

Smaller point sizes of bitmap fonts will sometimes need some hand editing. You can clean up the bitmaps by using Fontographer's bitmap font editor to fine-tune each character. Chapter Nine covers the bitmap window in more detail.

Automatic bitmap scaling

Generated bitmaps for characters that go above the ascent or below the descent are scaled vertically to fit the bitmap, since by definition there are no bits above the ascent or below the descent of a bitmap. Stroked characters with miter joins may cause a similarly scaled bitmap. Changing the join type to round or bevel before generating bitmaps will prevent this scaling.

Note: You can make this change to all the characters in the font by selecting all the characters in the font window before making the change to the join type in the "Character info..." dialog.

Changed and Selected characters

You have the flexibility of generating a single character or a group of characters. Single characters are valuable when you have hand-edited a previously generated bitmap, but need to make minor changes to a few outline characters. If you generate bitmaps only for the characters which have changed, then only those characters will need to be retouched by hand.

The "Changed characters" and "Selected characters" buttons only apply to the generation of bitmaps.

Note: All old type "FONT"s will be converted to "NFNT"s. The ID number of the "FOND" will be retained.

Selected characters

This option allows you to direct Fontographer to generate bitmaps for only those outline characters that are currently selected in the font window. This is useful for those instances where you have edited one or more characters in a previously generated bitmap and don't want to lose your edits.

Note: If you make very minor changes to the outline, you can select this option. ***Be sure to regenerate bitmaps if character widths have changed,*** since the widths in both PostScript and bitmap files must match for proper spacing.

To generate selected characters:

- Select the desired characters from the font window.
- Choose "Generate fonts..." from the File menu.
- When the dialog box appears, choose an Outline format of "None" and click on the "Selected characters" radio button.

To generate every character, choose "Select all" from the font window before generating the bitmaps.

Changed characters

This option provides bitmap generation for outline characters that have changed since the last bitmap generation. If you click the "Changed characters" radio button in the "Generate fonts" dialog box, Fontographer will generate bitmaps for the characters that have changed since you last generated the font. Fontographer remembers which characters you have changed until the bitmaps for those characters are regenerated.

The Bitmap ID Field

The ID field is provided to assign the font family ID. Bitmap fonts are identified internally by a unique number ranging between 1 and 16,383 (this range may be assigned in Fontographer). Numbers between 1 and 1,023 have already been used by Apple and other font developers and should not be used. Apple has reserved font numbers between 3,071 and 16,383 for commercial use. However, when creating a font, you must try to choose a value that does not conflict with those assigned to existing fonts. This is especially important with respect to your printing devices, like those at your service bureau. Altsys recommends that you assign font numbers ranging from 1,024 to 3,070 to avoid those conflicts. Fontographer will automatically select an ID which does not conflict with any fonts installed in your system.

Conflicting font IDs are automatically renumbered by the Font/DA Mover during font installation, but this renumbering can cause confusion when the font is used. Most Macintosh programs identify fonts by ID number, not by name. Thus, if you move a document from one computer to another, the displayed fonts may change if numbering conflicts occurred during font installation. The best way to avoid this problem is to number all your fonts uniquely so the Font/DA Mover does not have to renumber them. Again, we recommend you start with font family ID 1,024 and count up; this is the best compromise we can suggest for now.

When Fontographer assigns FOND IDs, it automatically picks a unique ID number that is not currently installed in your system. For instance, if you have a FOND ID of 1024, Fontographer will try to assign ID 1,025. If ID 1,025 is taken, it will try to assign 1,026, and so on.

Fontographer generates NFNTs (New Fonts). NFNTs originated with the advent of the 128K ROM Macintoshes. Earlier Macintoshes used the FONT resource type, which had a range of ID numbers no higher than 255. NFNT ID numbers can range up to 32,767. The range between 16,383 and 32,767 is reserved by Apple for Script Manager fonts. You should not trouble yourself about the numbering of NFNT resource IDs, since they are numbered randomly.

Note: Fontographer fonts are fully compatible with all versions of Suitcase, Font/DA Juggler, and Master Juggler. When using these programs, refer to their manuals for instructions on installing fonts.

Chapter Five

Installing Fonts

There are two major steps involved in installing a Macintosh font: The bitmap and PostScript fonts must each be installed before use. The installation process is simple, but must be done right or the font will not work properly.

Installing bitmap fonts

Fontographer includes the standard Font/DA Mover program on the "Tools & Utilities" disk. If you are not familiar with its use, refer to your Macintosh Utilities manual.

To install a bitmap font file:

- Double-click on the bitmap font file.

  Fontographer's screen fonts are represented by a suitcase icon with the letter "A" inside it. The Font/DA Mover will start up, showing the contents of your file in the left window.

- Click "Open" under the right window, then find and "Open" your System file with the file selection dialog.

  Note: It is a good idea to remove your old fonts before adding new (updated) regenerated fonts. (Refer to the next section, "Removing old fonts.")

- Select all the font sizes in your font's window and click "Copy."

You can select more than one font at a time by dragging the cursor down the list or by clicking on different fonts while holding down the Shift key.

Installation of the fonts may take a couple of minutes.

- **Click "Quit." The bitmap fonts are now installed and ready for use.**

Once installed in the System file, the bitmap font file is no longer needed for printing or displaying and may be stored with the Fontographer font file and Adobe Font Metrics (AFM) file in your archival font library.

Note: You may also install the bitmaps with Suitcase, Master Juggler, or Font/DA Juggler. Install your fonts according to their instructions.

Removing old fonts

If you have changed your font's ID number or name, you should always remove all old versions of the font before installing the new ones. Failure to remove the old versions could cause confusion which might result in printing the wrong font.

To remove old fonts:

- Open your System file with Font/DA Mover.
- Select the fonts to be removed and click "Remove."

Caution: Once you have deleted a font, it cannot be recovered. It would be advisable to have a backup copy from which to work in order to prevent any catastrophes.

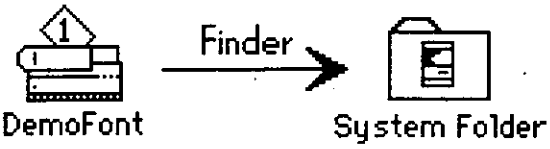
Some system fonts cannot be removed. If you attempt their removal, a dialog box will notify you of this fact.

Note: Certain resources cannot be removed while MultiFinder is active. It might be necessary to switch to the Finder and "Restart" your Macintosh before removing fonts.

Installing PostScript fonts

The PostScript font file has an icon which looks like a LaserWriter with a sheet of paper containing the number "1" or "3" emerging from it. It is easy to install.

- **Use the Finder to drag the PostScript font file into the System Folder on the disk with which you will be using the font.**



Installation is complete.

Note: In case you are thinking about putting the PostScript font file somewhere other than in the System Folder, read this:

The printing software always looks in the System Folder first when searching for a PostScript font. If it doesn't find it there, it looks in the folder containing the application doing the printing.

We suggest you put the PostScript font into the System Folder, rather than the application folder, thus eliminating a major source of confusion. Scattering a few fonts in each application folder quickly grows to the point where there may be several versions in different folders and each prints slightly differently. Things get out of control and it is impossible to remember which font to use for a particular print job. Sometime later, you change a character, but the change doesn't seem to "take" since your print job picked up an old version of the font. It has happened to us; it can happen to you—make life easy and put PostScript fonts into your System Folder.

Other font files

DemoFont

Fontographer's font file does not get installed. It is only required when creating and editing the font and need not be present in order to use the font.

DemoFont.AFM

The AFM file is a special "character metrics" file. Its icon is labeled with a name that ends with the letters ".AFM." Whenever you generate PostScript, Fontographer generates the AFM file automatically. Certain text handling programs use this file. Install it only if specified by applications which require it. Otherwise, you can ignore the ".AFM" file.

Downloading fonts to a hard disk

So far we have only discussed automatic downloading. The reasons are simple: it works, and it is easy to use. For most people, automatic downloading is the only reasonable way to use fonts.

On the other hand, some people don't use a huge variety of fonts. They need only one font, like a logo font or one specific foreign language font. They print documents all day using this font, and it is painful to wait for the same font to be downloaded over and over.

The solution for these people is a permanently downloaded PostScript font. Rather than downloading the font each time, it can be downloaded once when the printer is turned on and left there all day until the printer is turned off. However, if you are printing on a printer shared by a network, you should use the automatic downloading method.

Fonts are manually downloaded with Apple's LaserWriter Font Utility program included on Fontographer's "Tools & Utilities" disk. With this program, you can download PostScript fonts to the printer's memory or to the printer's hard disk.

To download to a hard disk:

- **Select the printer to which you wish to download by using the "Chooser" option in your Apple menu.**

LaserWriter Font Utility

- **Start the LaserWriter Font Utility download program by double-clicking on its icon from the Finder.**

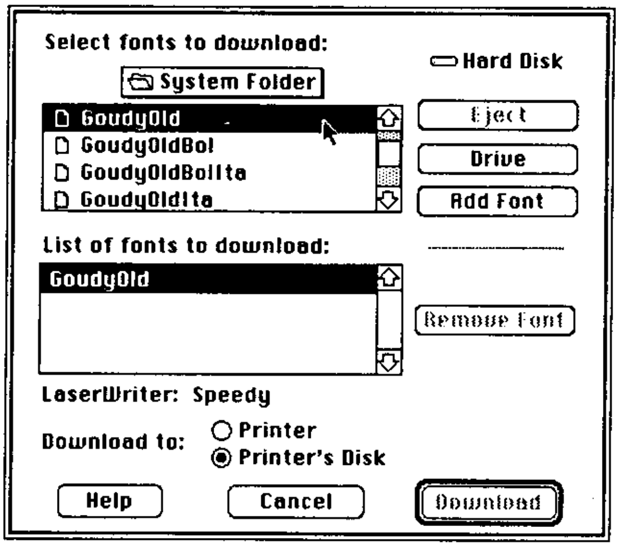
The program displays the "LaserWriter Font Utility" window.

- Click "OK."
- Choose "Download Fonts..." from the File menu.

A "Select fonts to download" dialog box appears.

- Select a font to download.
- Click "Add Font."

The font to be downloaded will appear in the lower window.



Select fonts to download:

List of fonts to download: GoudyOld

LaserWriter: Speedy

Download to: ○ Printer ● Printer's Disk

- Repeat to add more fonts.

You have the option of downloading to the printer or to the printer's hard disk.

- Click "Download."

A dialog box appears showing the download's progress. When the download has finished, you will receive another dialog box stating "Download completed."

- **Click "OK" and you are finished downloading your font.**

Note: If you are replacing a font (with a newer version), it is a good idea to remove the font from your printer before installing the new version.

Using your fonts in a document

After you install your fonts, they may be used like any other fonts.

- **Select the font from the application's font menu or font selection window.**
- **Type your text in that font, changing fonts, sizes, and styles as required.**
- **Print your document. The PostScript font is automatically downloaded and used for printing.**

To make sure your font works correctly, try printing from different applications.

With an unexpanded LaserWriter memory configuration, only three to five normal-sized fonts can be used at one time. If more are used, the LaserWriter memory overflows, either causing memory errors or simply resetting the LaserWriter and printing the startup sheet. In principle, PostScript is capable of handling an unlimited number of fonts; this Laser-

Writer limitation is only due to the limited amount of memory available for font storage. Other printers may have more memory available and could therefore store more fonts.

Note: If you use a variety of fonts in your documents, choose the "Unlimited downloadable fonts..." option from your "Page Setup" dialog. This option trades-off printing speed for the ability to have an unlimited number of fonts in a document.

Chapter Six

Printing Samples

You have just created your font or perhaps just a few characters of that font, and now you would like to see those characters in various point sizes and kerning combinations. Maybe you created a large "Do Not Disturb" sign for your office door and want to print it now before you actually go through Fontographer's installation procedures. *Good news!* You can print a sample of your choice any time your font is open, from any of its windows.

Fontographer gives you the choice of printing a variety of samples:

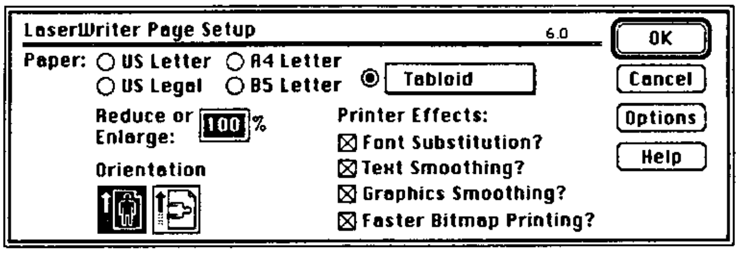
- All characters in the font.
- Individual characters.
- Specific typed text.
- A PostScript sample with several lines of text.
- A key map, which shows all the characters in the font and their respective widths, codes, and offset specifications.
- A complete list of all the kerning pairs in the font.
- A character sample in assorted sizes or just one giant character.
- A sample that shows the X/Y coordinates of the points of a selected character.

However, before you choose from the print sample menu, it is important to decide which printer you will be using since Fontographer only prints to PostScript printers.

To print a sample:

- Select the printer you wish to use from "Chooser" under the Apple menu.
- Choose "Page setup..." from the File menu.

The standard LaserWriter Page Setup dialog box appears.



LaserWriter Page Setup 6.0

Paper: ○ US Letter ○ A4 Letter ○ US Legal ○ B5 Letter ● Tabloid

Reduce or Enlarge: 100 %

Orientation

Printer Effects:

☒ Font Substitution?

☒ Text Smoothing?

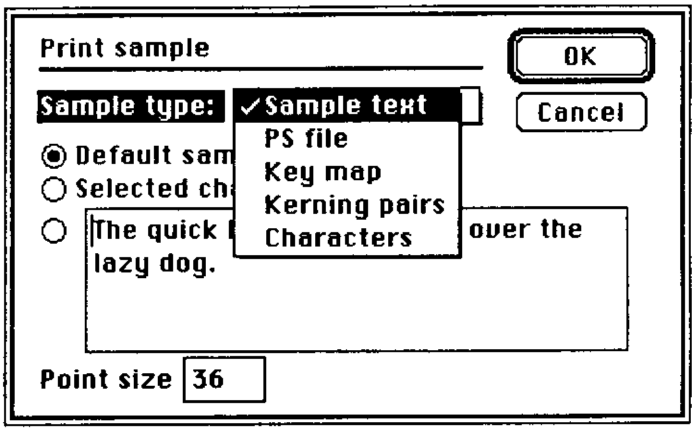
☒ Graphics Smoothing?

☒ Faster Bitmap Printing?

You can choose either vertical or horizontal page orientation. None of the other options will have any effect on your printed samples.

Print samples

Fontographer provides several options for printing font samples, each of which gives you the opportunity to choose the point size of your printed sample.



Sample text

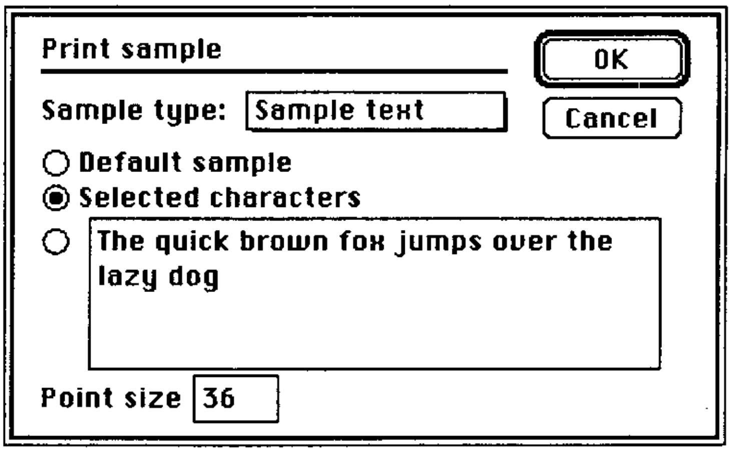
There are five major types of font samples. "*Sample text,*" the first choice in the "Print sample" pop-up menu, provides three printing options.

Choosing "***Default sample***" prints a standard PostScript print sample, which shows all the characters of the font in 36 point size (or any point size you designate).

To print a default sample:

- Choose "Print" from the File menu.
- Click on the "Default sample" button in the "Print sample" dialog box.
- Click "OK."

Choosing "*Selected characters*" allows you to print characters selected in the font window at a designated point size.



Print sample

Sample type: Sample text

○ Default sample

● Selected characters

○ The quick brown fox jumps over the lazy dog

Point size 36

To print selected characters:

- Select the characters you wish to print.
- Choose "Print" from the File menu.
- Click on the "Selected characters" button in the "Print sample" dialog box.
- Click "OK.

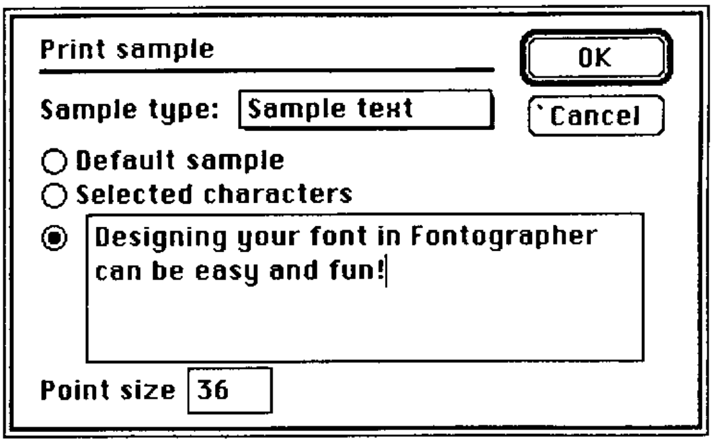
To print specific text samples:

- Choose "Print" from the File menu.

- Click on the "text" button in the "Print sample" dialog box.

  The "text" button is located to the left of the "text sample" box.

- Type your text into the "text box" or choose the "Default sample" option, which will print "The quick brown fox..." text string.



Print sample

Sample type: Sample text

○ Default sample
○ Selected characters
● Designing your font in Fontographer can be easy and fun!

Point size 36

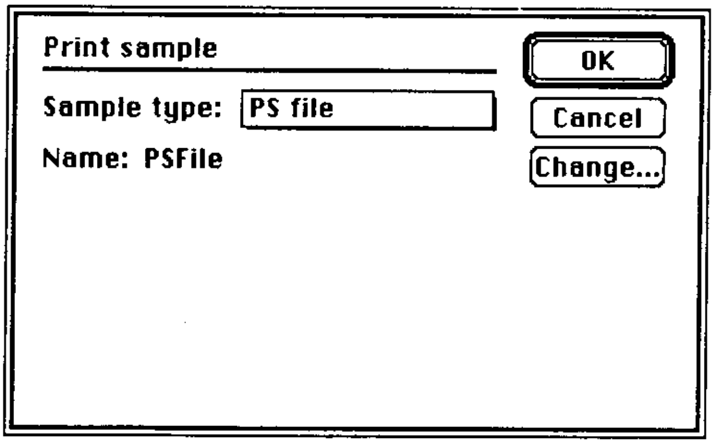
Fontographer allows you to type up to four lines of text in the "text box."

- Click "OK."

Note: The "text box" is a good place to test logos, kerning pairs, or character spacing in specific word and sentence combinations.

PostScript Sample type

"*PS file*" provides you with custom print samples. Choosing this option allows you to specify a custom PostScript file; Fontographer then sends this file to the printer along with the font. Click the "Change..." button to change this file to a different PostScript file. Several PostScript text files are provided with Fontographer; the most useful one is named "PSFile." You may use these as is, or you may edit them with any text editor to define your own custom print sample.



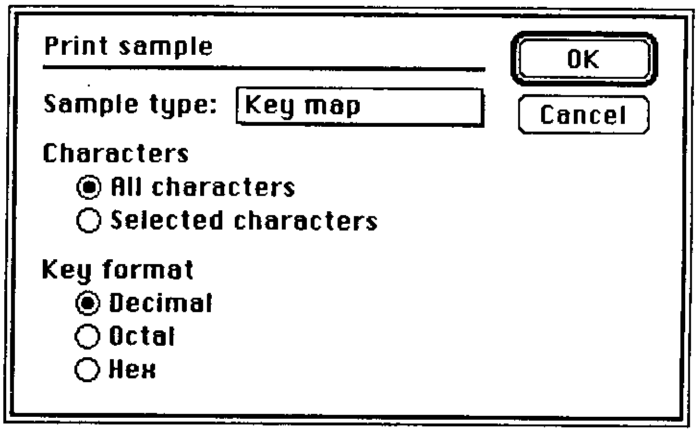
Print sample

Sample type: PS file

Name: PSFile

Key map Sample type

Choosing "*Key map*" prints four pages, which contain all the characters in the font. The printed pages consist of eight rows of characters, eight characters across. This print sample will show all the characters along with their offsets, widths, and corresponding key codes. Fontographer gives you the option of showing the code in Decimal, Octal, or Hexadecimal.

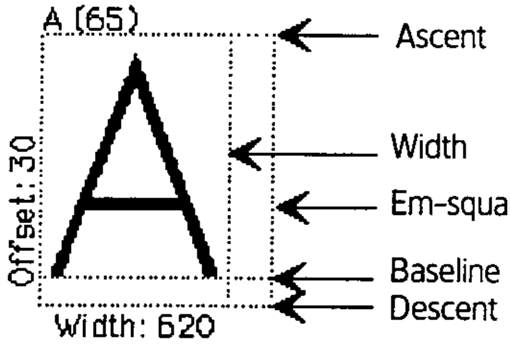

Print sample

Sample type: Key map

Characters
● All characters
○ Selected characters

Key format
● Decimal
○ Octal
○ Hex

A character with a normal offset (not less than zero) will print a key map sample that looks something like this:



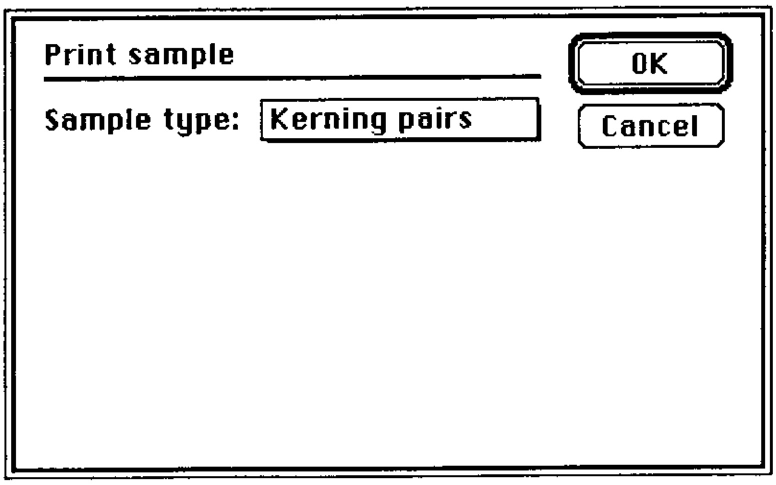
The key map lines correspond to the character components (which are not displayed on the key map but are indicated by arrows in this illustration).

Undefined characters will be indicated by a shadowed box with a code (Dec, Oct, or Hex) and the word "Undefined."

Note: Depending on your printer and the complexity of your font, the time it takes to print a font may vary from a minute to a few minutes.

Kerning pairs Sample type

By choosing the "*Kerning pairs*" Sample type, it is possible to see a list of the kerning pairs that are in the font. A full page, consisting of four columns, prints out showing each pair, the number of em-units of each pair, and the percent of the em each kerning value is. The actual kerning pair samples are *not* printed, only a listing of the pairs and their kern values.



Print sample

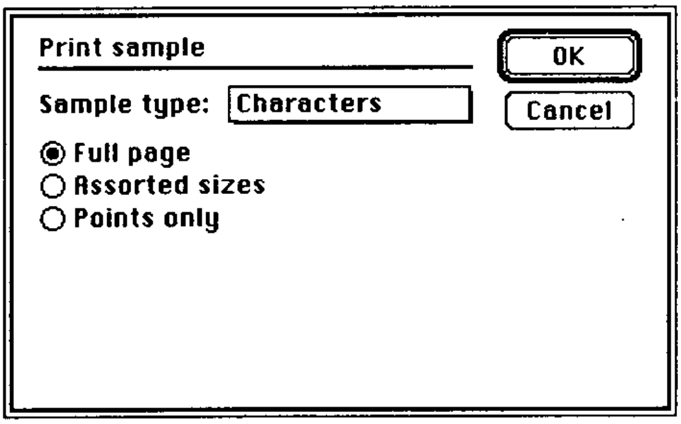
Sample type: Kerning pairs

Characters Sample type

When the "*Characters*" Sample type is chosen, Fontographer provides you with three different choices: printing several assorted sizes of the character, one giant character, or an X/Y sample that shows the points of the character.

To print one (full page) character:

- Open a character window.
- Choose "Print..." from the File menu.
- Choose "Characters" from the "Sample type" field.
- Click the "Full page" radio button.



Print sample

Sample type: Characters

● Full page
○ Assorted sizes
○ Points only

This is the quickest way to print a single character.

Note: This print option is only available while the character window is active.

To print characters in assorted sizes:

Repeat the steps for printing a full page character, but click on the "Assorted sizes" radio button instead of the "Full page" button.

To print a sample showing the X/Y coordinates:

- Open a character edit window.
- Choose "Print" from the File menu.
- Choose "Characters" from the "Sample type" field.
- Click the "Points only" radio button.

Note: The "Characters" Print sample option is only available while the character edit window is active.

The print header

All printed samples have a similar print header. The gray box that occupies the left corner of the header tells which type of print sample it is. For instance, if you choose the "Kerning pairs" option, the header will read "Kerning." If you choose "Selected characters," the header will read "Selected," and so on. An individual character such as the letter "S" will only have that character as a header.

The rest of the box will give the name of the font, the font size, any applicable textual information, and the date and time of printing. This is useful for archival filing and other quality control procedures.

Section Two

Design and Windows

Chapter Seven

The Character Edit Window

The *character edit window* is used to create and edit characters. This is where the detailed character editing takes place that forms your characters and eventually your font. The character edit window, like a drawing table, has the standard tools necessary to create all your characters. Most of your editing time is spent here, so it is important to familiarize yourself with this window. Multiple windows (up to 30) can be opened so that different characters can be worked on at the same time.

To open a character window:

There are four ways to open a character edit window:

- Click on the desired character in the font window, then choose "Open outline char" from the File menu or type ⌘H.

OR

If you want to open a specific character, the "S" for example:

- Double-click on the "S" in the font window.

OR

- Type the character on your keyboard and then type ⌘H.

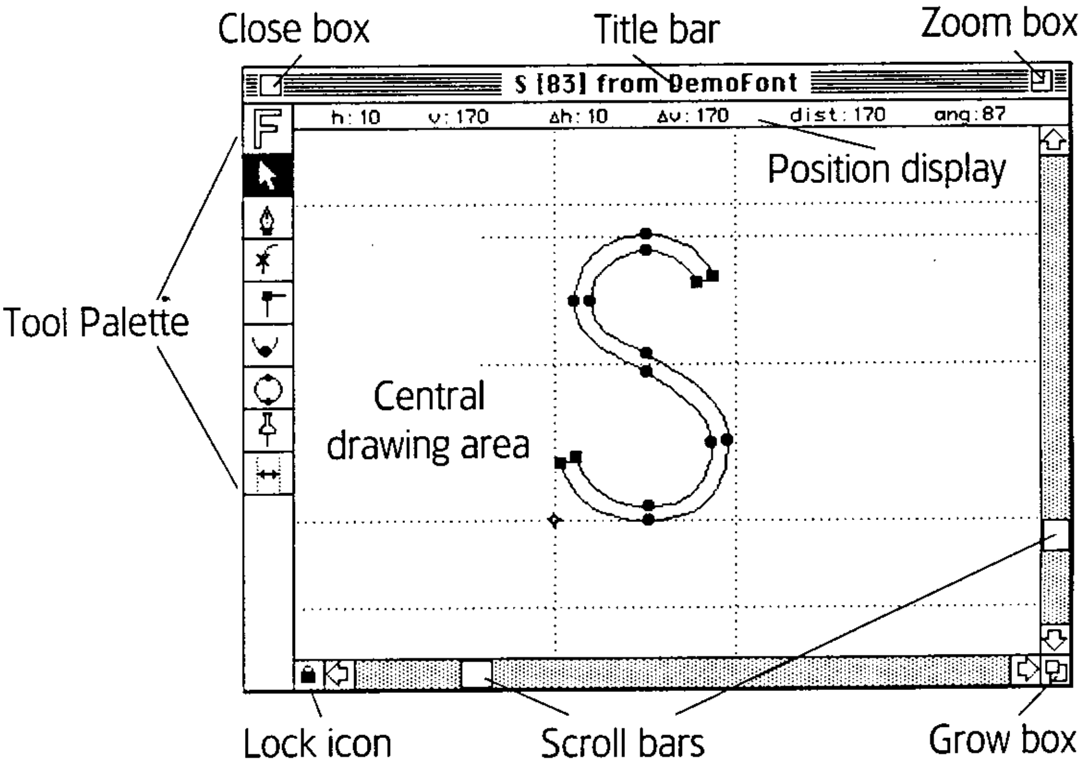
OR

- Click on the desired character and press the Return or Enter key.

The character edit window

The *character window* has the standard title bar, close box, scroll bars, and zoom box. Close the window by clicking on the close box or by choosing the "Close" command from the File menu. Click on the zoom box to resize the character edit window.

The title of a character edit window begins with the character being edited, followed by its Decimal key code, and the name of the font. You can move the character window around the screen by clicking on its title bar, holding the mouse button down, and dragging the window to a new location.

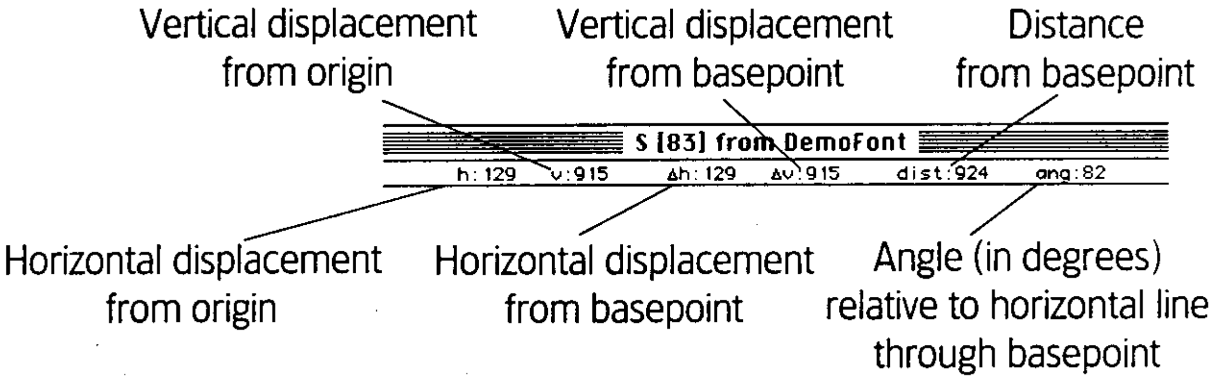


Scroll bars

Standard *scroll bars* are drawn along the right side and bottom of the window. By moving the scroll bars, the visible part of the character can be moved around within the window.

Position display

Directly below the title bar is the ***position display***, which shows the horizontal and vertical displacements and distance from the base point.


Vertical displacement from origin
Vertical displacement from basepoint
Distance from basepoint
S [83] from DemoFont
h: 129
v:915
Δh: 129
Δv:915
dist:924
ang:82
Horizontal displacement from origin
Horizontal displacement from basepoint
Angle (in degrees) relative to horizontal line through basepoint

The left part of this display shows the horizontal and vertical components of the pointer position in terms of the coordinate space in which the image is defined.

The right part of the position display shows the horizontal, vertical, and straight line distance between the pointer and the basepoint. These distances are also expressed in image coordinate space units. Since the basepoint may be repositioned as needed, this part of the display may be used for measuring the exact distance between any two points in image coordinate space.

Exact positioning of points is possible by moving the pointer while watching the coordinate display. This display continuously tracks the pointer position as long as it is in the drawing area. Horizontal coordinates increase to the right. Vertical coordinates increase moving up the screen. Since the image coordinate space may have much greater resolution than the screen, each one unit change in the pointer position may change the display by more than one image unit.

The position display values increment by a step size controlled by the size of the image on the screen; enlarged close-ups have a smaller move increment than reduced overviews.

When dragging background pictures or composite characters, the position information bar displays the mouse location, and the delta values display the offset of the origin point of the composite or picture, relative to the base point.

🔒

A ***lock icon*** is in the lower left hand corner of the character window. If the lock is black (and in a locked position), it locks the current character into that window. This prevents a character from being changed in case another character key is accidentally hit.

🔓

When the lock is unlocked, you can change the character in the character edit window to another character by typing in a new character.

The lock icon can be toggled on and off by pressing the Return or Enter key, or by clicking on it.

The lock icon enables additional keyboard and numeric command features which are covered in more detail later in this chapter in "Changing characters" and "The tool palette."

The largest area of the window is the *central edit area*. This is where all drawing and editing takes place. The character that appears here may be moved around with the scroll bars or with the scrolling hand. It may be zoomed in for a more detailed view or zoomed out for an overview. Dotted horizontal guidelines are drawn here to indicate the ascent, baseline, and descent specified for this font. Vertical guidelines at the origin and width are also shown. Any additional guidelines you set up will also be shown as dotted lines.

Viewing and sizing the character picture

At the bottom right of the window is the *grow box*, which allows the character view to be resized. The view of the outline character can also be changed by using the "Enlarge" or "Reduce" commands from the View menu or choosing their corresponding keyboard commands.

The "Enlarge" command zooms in to show more detail of the character. If a single point is selected, that point is moved to the center of the screen. If several points are selected, their center of gravity is moved to the center of the screen. If you wish to zoom in on a particular section of a curve, select the points in the curve and then zoom.

To enlarge or zoom in on the character:

- **Press the Space bar and Command key and click in the character edit area, or type ⌘E.**

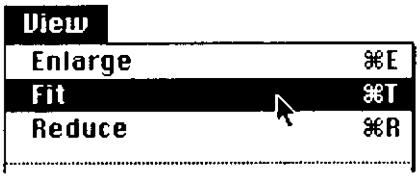
The "Reduce" command reduces the size of the character by zooming out from it.

To reduce or zoom out on the character:

- Press the Command, Option, and Space keys and click in the character edit area or type ⌘R.

Fit

The "*Fit*" command scales the character so its em-square height just fits into the window. It also centers the character within the window.



Demagnification

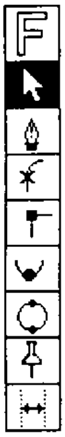
Most drawing programs require scaling up to a more detailed view to draw intricate designs. Sometimes, however, this causes a loss of overall perspective. Fontographer has a unique capability called a ***demagnified move***. This displays an excellent view of the character while still allowing precise moves (via the position display) at full resolution.

To use demagnification:

- Hold down the Control key while dragging a point.

Demagnification is covered in more detail later in this chapter under "Moving points."

The tool palette



The indicators and tools that are drawn down the left side of the window make up the ***tool palette***. The first box in the tool palette shows the current drawing plane and allows for changing that plane. The boxes below the drawing plane indicator are tools, which we discuss shortly.

Drawing planes

Fontographer has three drawing planes: ***foreground, background,*** and ***guidelines.*** The top indicator in the tool palette shows which of Fontographer's three drawing planes is currently active. Each plane is used in a different fashion to help make character construction easy. Fontographer allows drawing on any of these three planes.

While the lock icon is in the locked position, you can change the drawing planes by typing the characters "f," "b," or "g," to move to the foreground, background, or guidelines plane, respectively.

The ***drawing planes*** indicator is a solid "F" when drawing in the foreground plane, a gray "B" when drawing in the background plane, or several dashed guidelines when drawing in the guideline plane. Successive clicks on the drawing plane indicator change the planes from foreground to background to guidelines, and back to foreground. Any drawing or editing occurs in the currently selected plane.

While the lock icon is in the locked position, you can switch between the foreground, background, and guidelines planes by typing the characters "f," "b," or "g."

To hide drawing planes from view:

- Hold down the Option key and type "f" to hide the foreground plane from view. Repeat to bring the foreground plane back into view.
- Repeat this procedure to hide the background and guidelines plane, substituting "b" and "g" for the "f."

Foreground

The *foreground plane* is the primary drawing layer. Everything drawn in the foreground plane becomes part of the character definition.

Background

The *background plane* is used for construction lines or pictures. Everything drawn in the background is strictly for screen viewing only, and does not become part of the PostScript character definition. Pictures from some other Macintosh programs or page scanners can be pasted into the background and used as a template when drawing. The background image is always drawn in a gray pattern so it can be easily distinguished from the foreground.

Guidelines

The *guidelines plane* is used to construct drawing guidelines which are common to every character of a font (such as the x-height line). The guidelines plane is similar to the background plane, except it is drawn in a lighter shade of gray. Everything drawn in the guidelines layer of one character appears in the guidelines layer of every other character.

Guidelines may be edited from any character. Changes made to the guidelines plane are reflected in every character of the font. You may "Undo" changes made to the guidelines plane just like you do with an ordinary character. Guidelines are not part of the PostScript font; they are just a design aid.

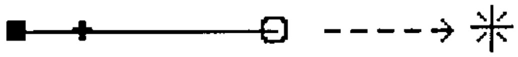
The selection pointer

The *selection pointer* works the same as in other Macintosh programs. It is used to select elements and drag points and objects. The pointer shape is an arrow when this tool is active. To change the selection pointer to a hand scroll tool in the drawing area, hold down the Space key. When control points are selected, the pointer assumes the shape of a crosshair. The selection pointer can be selected by clicking on its indicator. When the lock icon is in the locked position, the numeric keypad equivalent for choosing the selection pointer is "1." You can change the crosshair (in the central edit area) to the pointer simply by holding down the Command key.

The pen tool

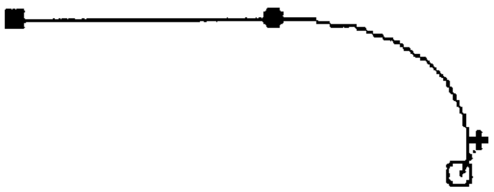
The ***pen tool*** is a multipurpose pen tool that is similar to the ones in Aldus FreeHand and Adobe Illustrator. The pen tool combines the capabilities of the tangent, corner, and curve points, in order to draw character paths without having to change tools. The pen tool can be selected by clicking on its indicator. The pen tool automatically adds curve or corner points depending on the movement of the mouse in the path being drawn. If you click and release, the pen tool places a corner point.

If you click and drag, the pen tool places a curve point where you click.



Drag the mouse in this direction

The shape of the curve is modified as you drag the mouse. The line blends smoothly into the curve when you place the next curve point.

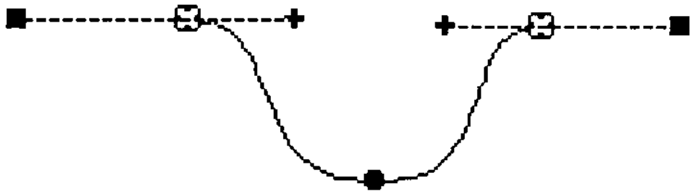


When the lock icon is in the locked position, the numeric keypad equivalent for choosing the pen tool is "2."

Control point tools

Tangent point

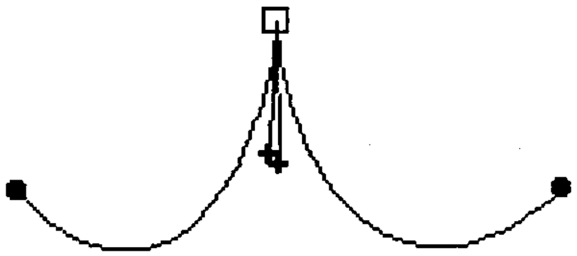
The *tangent point* tool is used to connect straight lines to curves with a smooth tangent join.



Tangent points may also be used to connect straight line segments together. The tangent point tool can be selected by clicking on its indicator. When the lock icon is in the locked position, the numeric keypad equivalent for choosing the tangent tool is "3."

Corner point

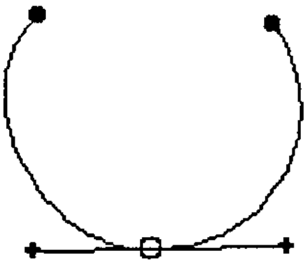
The *corner point* tool is used to join straight segments to curved segments at an angle or to connect two curve segments at a cusp.



Like the tangent points, corner points can also be used to connect straight segments at an angle. The corner point tool can be selected by clicking on its indicator. When the lock icon is in the locked position, the numeric keypad equivalent for choosing the corner point tool is "4."

Curve point

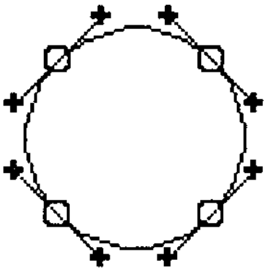
The *curve point* tool is used to join curves to other curves smoothly.



The curve point tool can be selected by clicking on its indicator. When the lock icon is in the locked position, the numeric keypad equivalent for choosing the curve point tool is "5."

Circle tool

The *circle tool* is used to draw circles. The circle tool is selected by clicking on its indicator. Selecting this tool and dragging in the edit area produces a four-point circle.



When the lock icon is in the locked position, the numeric keypad equivalent for choosing the circle tool is "6."

Basepoint tool

The ***basepoint tool*** allows the basepoint to be set to any location. By default, the dot at the intersection of the origin line and baseline is the basepoint. This point is used as a reference point for position measurements or as an aid in lining up points. All effects can operate using the basepoint as the center of the effect. The basepoint tool can be selected by clicking on its indicator. When the lock icon is in the locked position, the numeric keypad equivalent for choosing the basepoint tool is "7."

Width tool

The *width tool* is used to set the character width. It does not draw anything. Change the character width by dragging the vertical width indicator with the width tool selected. Character width can be adjusted in any of the three drawing planes. The width tool can be selected by clicking on its icon. When the lock icon is in the locked position, the numeric keypad equivalent for choosing the width tool is "8."

Tool key equivalents

The numbers used to select these tools are in the order of the tools in the tool palette. The selection tool is the first tool in the tool palette, thus it is number 1.

The pen tool is the second tool, and so its number keyboard equivalent is number 2.

Familiarize yourself with Fontographer's numeric keyboard commands; they provide you with an easy way to change the drawing tools.

Changing characters in the character edit window

By typing...

The character in the edit window can be changed to another character by disabling the lock icon in the lower left hand corner of the character window and typing the new character key.

🔒

A small lock is in the lower left corner of the character edit window. When the lock is black (in a locked position), it locks the current character into that window. This prevents the character edit window from changing to another character in case another character key is accidentally hit.

When the lock icon is locked, the numeric keypad is used to switch tools in the tool palette.

🔓

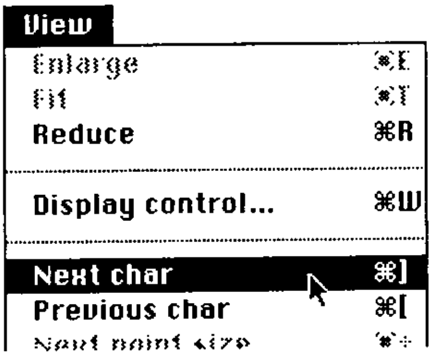
When the lock is white (in an unlocked position), the characters in the character edit window can be changed to another character simply by typing the new character key.

Clicking on the lock icon, or pressing the Return or Enter key toggles the lock icon on and off.

By using the menu...

To choose the next character:

- Choose "Next char" from the View menu or type ⌘].



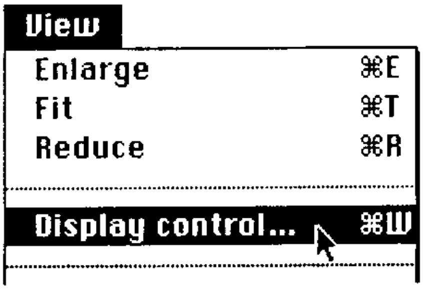
To choose the previous character:

- Choose "Previous char" from the View menu or type ⌘[.

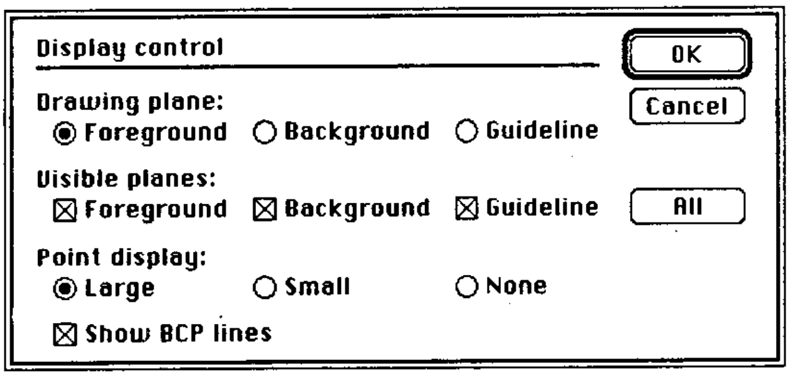
The display control

Changing the drawing planes

Change the current drawing plane by clicking on the drawing planes indicator, or by choosing "Display control..." from the View menu.



The "Display control" dialog box appears.



Display control

Drawing plane:
● Foreground ○ Background ○ Guideline

Visible planes:
☒ Foreground ☒ Background ☒ Guideline

Point display:
● Large ○ Small ○ None

☒ Show BCP lines

The drawing planes can be changed by clicking on their radio button. Additionally, any or all drawing planes can be hidden or made visible in the character window by clicking on the "Visible planes" boxes. Clicking "All" makes all the planes visible. The "Point display" controls the size of the points which will be displayed. Clicking "Show BCP lines" makes all the character's BCPs visible.

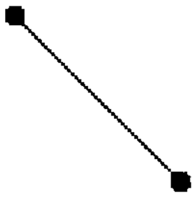
Paths and points

A *path* is composed of line or curve segments. These segments may be connected (the normal case) or disconnected (such as the dot on a lower-case "i"). Characters may consist of open paths or closed paths (but not both). The shape of each path is determined by a set of control *points* which may be connected, unconnected, open, or closed.

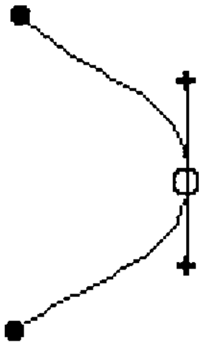
Control points, which may be tangent points, corner points, or curve points, define the shape of each character. These point types have been designed to facilitate smooth letter construction.

Fontographer automatically calculates the slope at each point in order to guarantee tangency. The point before the endpoint determines the depth of the curve; the point that follows determines its direction. The following examples illustrate the way this works.

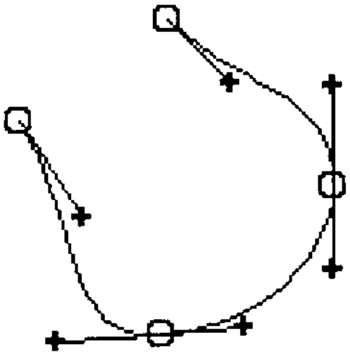
The first segment is straight since it doesn't yet know which direction the curve will be taking.



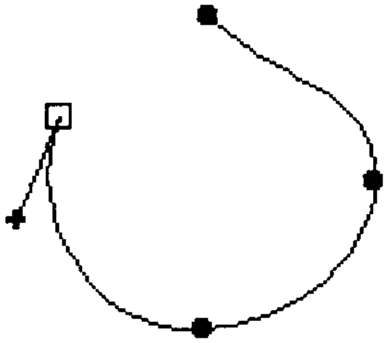
When the third point is placed, the first segment adjusts its curve accordingly.



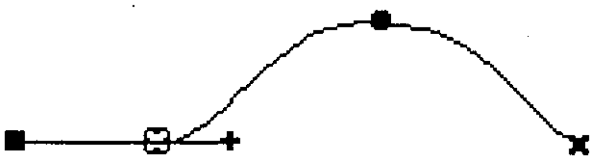
When the fourth point is added to the last end point, the curved segments join smoothly.



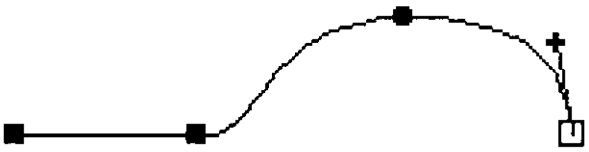
However, if the end point is a corner point, the curved segment ends at that corner point.



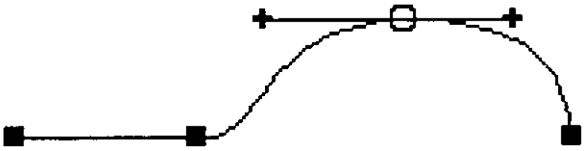
The slope at a ***tangent point*** that connects to a curve point is computed as the slope from the point preceeding the tangent point to that tangent point.



The slope of a ***corner point*** that connects to a curve point is the slope of an arc that ends at the corner point.



The slope at a ***curve point*** is an arc drawn through it and through the preceeding and following point.

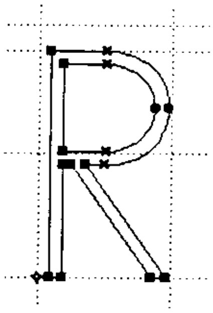


You can change all the slopes if you don't get the desired effect.

Adjusting points

One of the most frequent editing operations is adjusting already-drawn points. This operation is also one of the easiest to perform.

This letter "R" contains all three types of control points.

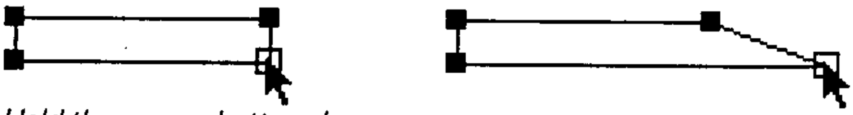


Viewing this illustration makes it easier to understand how the control points work together to create smooth curves, angles, and straight line segments.

The tangent point is used when connecting the straight lines to the curves with a smooth tangent join. The corner point is used when connecting straight lines to curves with an angular join. The curve tool is used to draw Bézier curved segments.

Editing control points

You can move points simply by clicking on the point and dragging it while holding down the mouse.



Hold the mouse button down, and drag the point from here → to here.

To move a point:

- Click on the selection tool.
- Position it on top of the point to be moved, and click.
- While holding the mouse button down, drag the point to a new location.

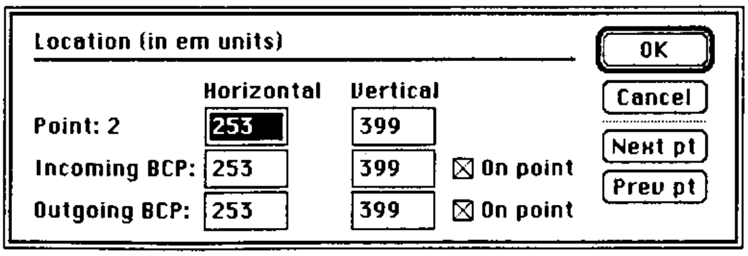
If the point is connected to other points, the connecting lines or curves are shown during the move, so you can see the effect of the move as it happens.

Keyboard commands to move points:

- Click on a control point to select it, and use the left-right or up-down arrow keys to move it by *one* em-unit.
- Click on the control point to select it, and hold down the Shift key while using the arrow keys to move it by *ten* em-units.

Accurate point placement

For accurate BCP and point placement, select the control point and choose "Location…" from the Point menu and type in the coordinates.



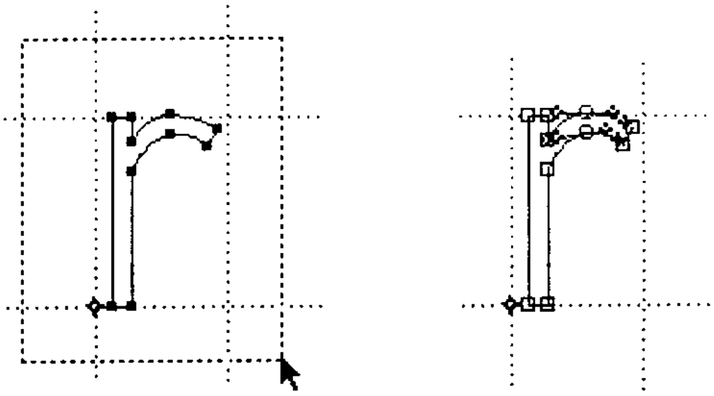
Location (in em units)

	Horizontal	Vertical	
Point: 2	253	399	
Incoming BCP:	253	399	☒ On point
Outgoing BCP:	253	399	☒ On point

To select multiple points:

- Position the pointer outside one corner of the character (or an area of points), press the mouse button down, and drag diagonally to the opposite corner of the group.

A dotted rectangle appears as you drag the mouse button.



The entire group of points is selected when you release the mouse and may then be dragged as a unit by dragging any point in the group.

You can select an entire path by double-clicking on any point in that path.

You can select more than one point by holding down the Shift key and clicking on each point individually.

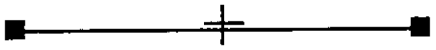
During the drag operation, the position indicators at the top of the window are continuously updated to show the actual position and distance of the pointer from the basepoint.

Inserting points

Often times, more control is needed over a shape than can be attained by adjusting the BCPs. Inserting a new point may be the only solution. Fortunately, this is very easy.

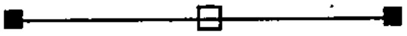
- **Select the appropriate point-drawing tool.**

- **Position the crosshair on the figure where the new point should be inserted. It should lie on top of a line or a curve.**

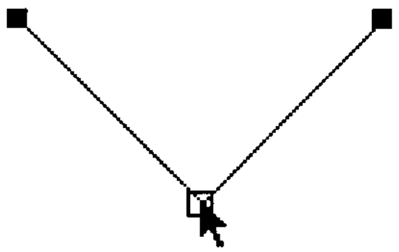


If the pointer lies some distance away from the line or curve, a new path is started, or the current active (open) path is continued.

- **Click on the figure. The point is inserted into the figure at that position.**

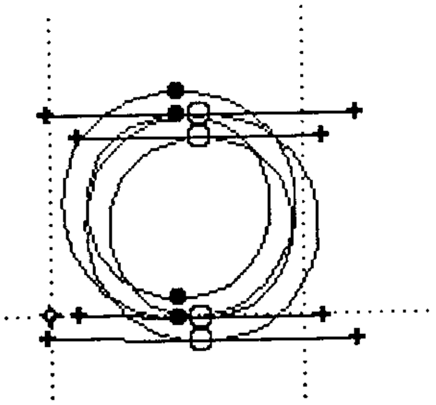


The figure can now be adjusted to the desired shape.



Duplicating points

By choosing "Duplicate" from the Edit menu, you can copy selected points. They will be offset slightly (down and to the right of the original image).

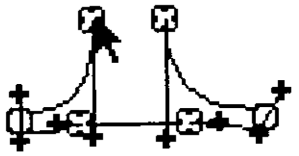


Our example shows how the old points are unselected, and the new duplicated points become selected.

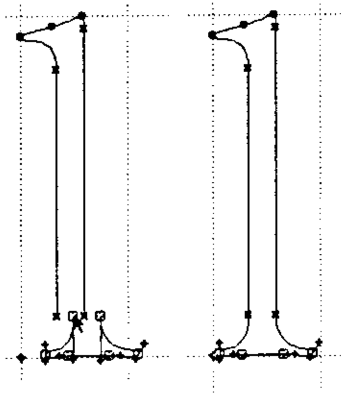
Merging points

Sometimes it is necessary to join points to one another (for example, when joining serifs to a uniform stem).

- **Double-click on a path to select all the points.**



- **Drag them until one of the points covers another point.**



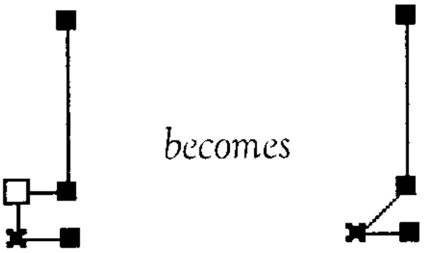
- **Release the mouse button.**

  This joins the points on either side and completes the path.

Removing points

There are two ways to remove a selected point or points:

- **Click on the point to select it.**
- **Choose "Merge point" (⌘M) from the Edit menu.**



As our example shows, this removes the selected point, but joins points on either side, so closed paths remain closed and open paths are not split into two pieces.

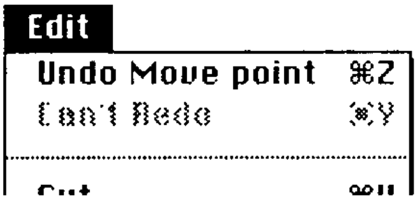
OR

- **Choose "Clear" from the Edit menu.**

  This removes an active point, opening the path up if it was closed, or splitting it if the path was open and the selected point was not an endpoint. The Delete (backspace) key is a shortcut for the "Clear" command.

Undo and Redo

Fontographer supports "Undo" and "Redo" of the last *eight* edit operations from the outline edit window. Simply choose "Undo" or "Redo" from the Edit menu. If there is nothing for Fontographer to undo or redo, the corresponding item is grayed out; otherwise the operation is listed along with the command.



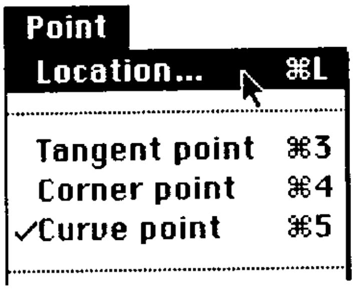
For example, after adding a point and then moving it, the Edit menu items are labelled "Undo Move point" and "Can't Redo" (which is grayed out).

No redo is possible until the most recent operation has been undone. Select "Undo" to undo the last operation, or "Redo" to redo the operation that was just undone. Performing the "Undo" would restore the character to the way it was before the last edit.

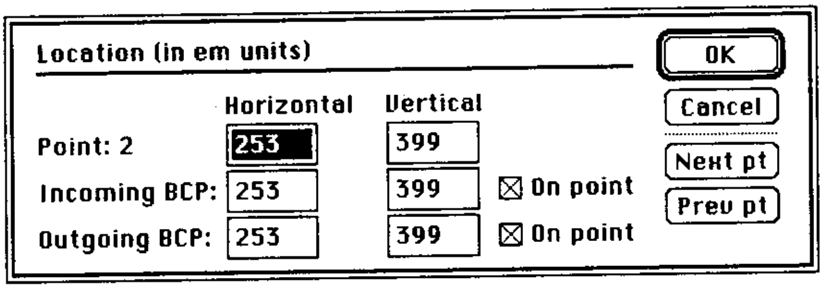
Editing may be resumed at any point, but obviously once an editing change is made, you cannot redo back to intermediate versions.

Location of a point

There may be instances where you are creating a font that needs to have exact coordinates. You can specify these coordinate points and the location of incoming and outgoing BCPs. Select a single point and choose "Location..." from the Point menu or type ⌘L.



The "Location..." dialog box displays the exact coordinates of the point. BCPs can also be set to an exact location.


Location (in em units)

	Horizontal	Vertical	
Point: 2	253	399	
Incoming BCP:	253	399	☒ On point
Outgoing BCP:	253	399	☒ On point

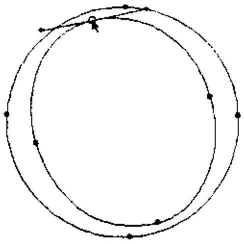
The Horizontal and Vertical coordinates of the point are displayed. The point may be moved to an exact location by typing new coordinates into these boxes.

The "Incoming BCP" and "Outgoing BCP" boxes give the locations of the BCPs. These can be moved on top of the point by clicking "On point" or set to exact horizontal/vertical coordinates by typing in the text boxes.

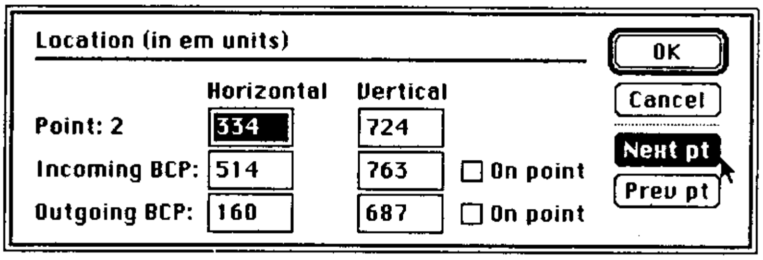
Accurate point placement

You can choose the next point and previous point to specify accurate point placement. This allows you to quickly work through all the points of a character and set precise locations. You can position the character window so that you can view the point selections interactively.

- Click on a control point to select it.



- Choose "Location" from the Point menu.
- Click "Next pt."



Location (in em units)

	Horizontal	Vertical	
Point: 2	334	724	
Incoming BCP:	514	763	☐ On point
Outgoing BCP:	160	687	☐ On point

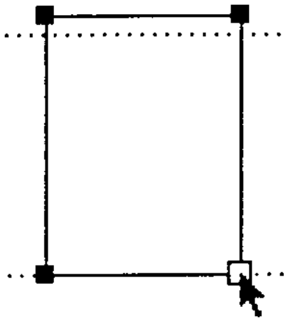
Fontographer automatically selects the next point in the path. Any new values entered will be set for the point and then updated in the character edit window.

Note: If the point you select is the last point in the path, selecting "Next pt" will select the first point in the next path (the outer circle in the case of the "O"). Conversely, if the first point in a path is selected, selecting "Prev pt" will select the last point in the previous path.

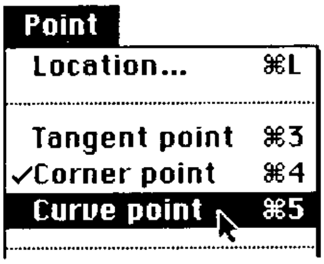
Changing a point type

A point type can be changed in one of two ways:

- Select the point (we chose a corner point in our example).

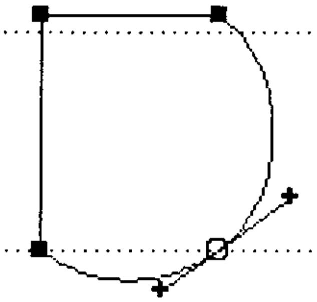


- Choose "Curve point" from the Point menu.



The check beside "Corner point" in the Point menu indicates that the selected point is a corner point.

The point changes from a corner point to a curve point.



The alternative (and faster) way to change the point is to:

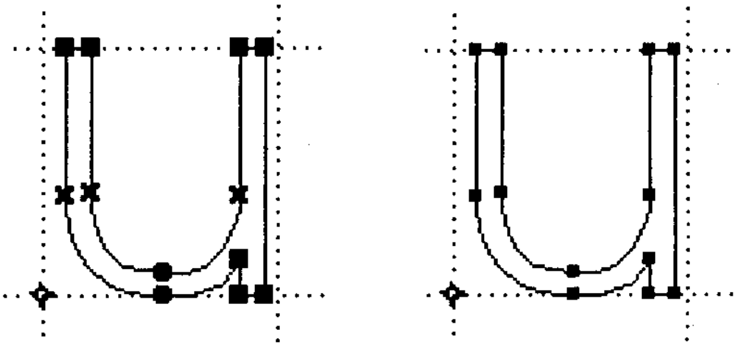
- **Click on the corner point and type ⌘5.**

  All control points can be changed this way.

Note: The "Undo" and "Redo" commands will switch the point back to its last state.

Show and hide control points

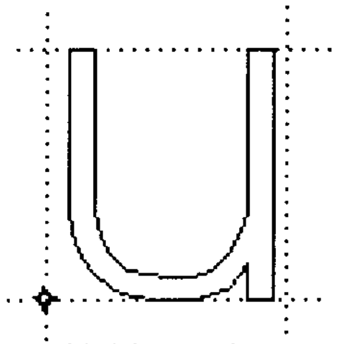
The "Display control" dialog also has radio boxes for ***showing*** or ***hiding control points***. By clicking on a box in the "Point display," these points can be made large, small, or completely hidden from view. You can also change the display of points by choosing "Show points" from the Point menu.



Large points

Small points

Choosing a "Point display" of "None" can be useful when a clean character outline is desired without the clutter that is introduced by showing each point. Changing the size of the points does not affect other functions of Fontographer. You can continue drawing the same way, but the point sizes will be different.



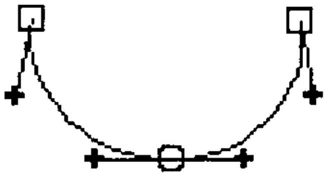
Hidden points

Editing and placing BCPs

Fontographer gives you considerable control over the shape of curved segments. This is made possible by adjusting the position of the Bézier Control Points (BCPs, so named because Fontographer's curved segments are Bézier curves). Bézier curves define complex shapes with a minimum number of points. This makes the resulting curves smoother and easier to edit.

Fontographer automatically defaults to show any BCP lines when a control point is selected. BCP lines can be hidden by choosing "Display control..." from the View menu and unchecking the BCP line box to turn it off.

BCPs work like levers. Moving the lever adjusts the angle of the curve. The length of the lever determines the degree and depth of the curved segment. The two BCPs of a curve point and the curve point lie on a straight line.

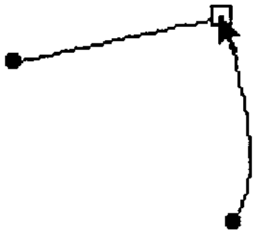


Selecting a control point activates the BCPs. There are two BCPs associated with each control point in a curved segment.

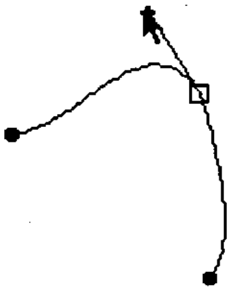
The BCPs may lie on top of the control point and not be visible.

If a BCP and a control point lie on top of one another, any attempt to select the BCP will select the control point instead. In other words, the point is selected before the BCP is seen. To circumvent this problem, select a point, hold down the Option key, and then drag to move the BCPs.

- **Click on the corner point to select it.**



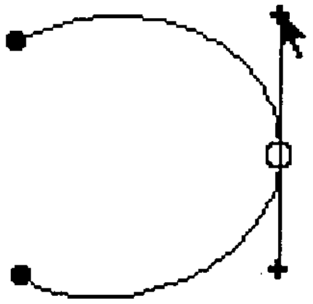
- **Press the Option key and drag.**



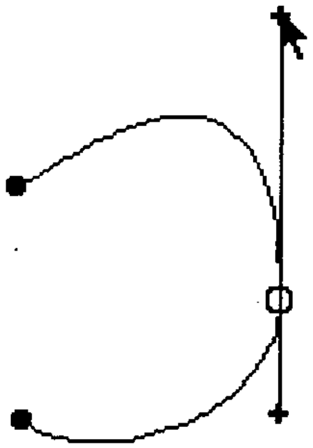
Dragging a curve point's BCPs

A curve point and its BCPs lie on the same line. Each BCP (and its curve segment) is affected by the movement of the other BCP. Dragging one BCP affects the other to maintain *collinearity*.

- Click on the BCP and drag.

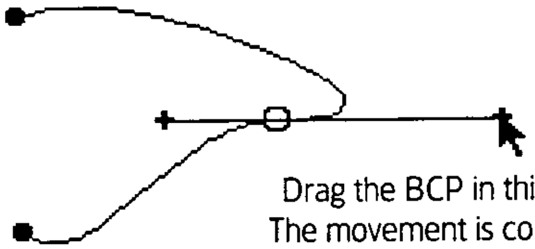


As you drag the BCP left or right, the other BCP moves along with it.



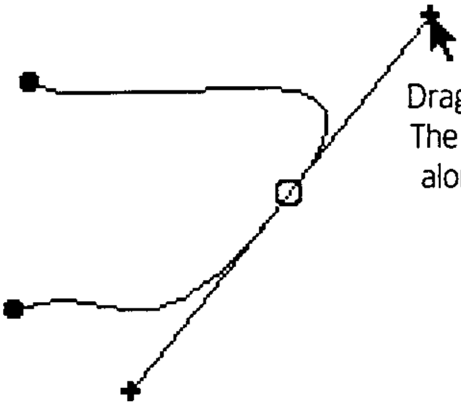
Pressing the Shift key while dragging a BCP constrains movement to the horizontal or vertical coordinate of the point.

- **Press and hold down the Shift key.**
- **Click on the BCP and drag.**
- **Move the control point either vertically or horizontally (these are the only directions the control point will move while it is being constrained).**


Drag the BCP in this direction. The movement is constrained to the vertical coordinates of the point.

The control point stays in the same position while the shape of the curve is adjusted according to the direction of the BCP's movement.

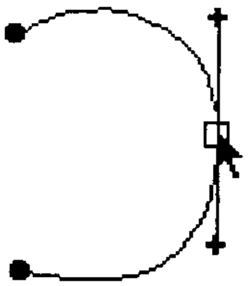
Holding down the Shift-Option keys constrains the BCP's movement to the slope of the curve.


Drag the BCP in this direction. The movement is constrained along the slope of the point.

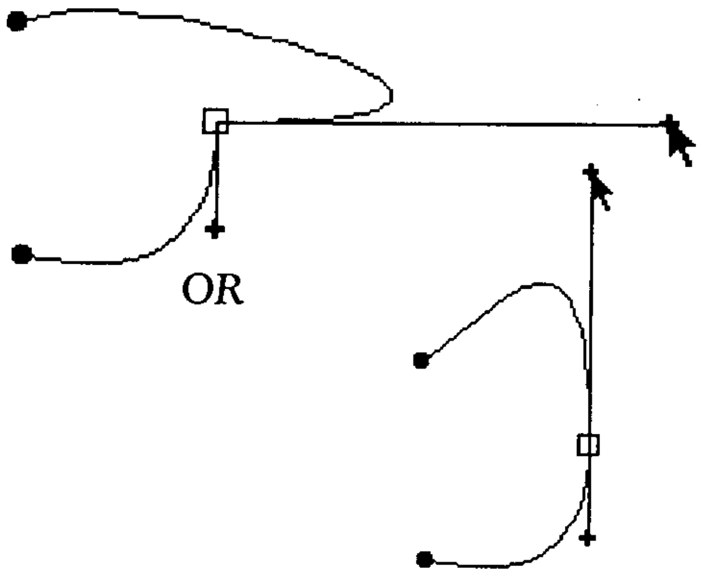
Dragging the BCP of a corner point

A corner point's BCPs generally lie on top of that same corner point. To select an incoming or outgoing BCP, hold down the Option key before clicking on the BCP. Moving or adjusting one BCP does not move the other BCP or its attached segment.

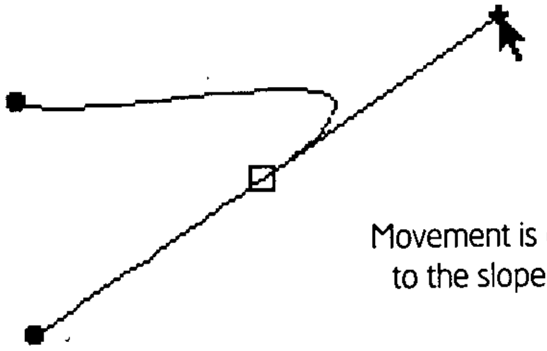
- Press and hold down the Shift key.
- Click on the BCP and drag.



The BCP's movement will be constrained to either the horizontal or vertical coordinate of the point.



Holding the Shift-Option keys down constrains the BCP's movement to the slope of its tangent.

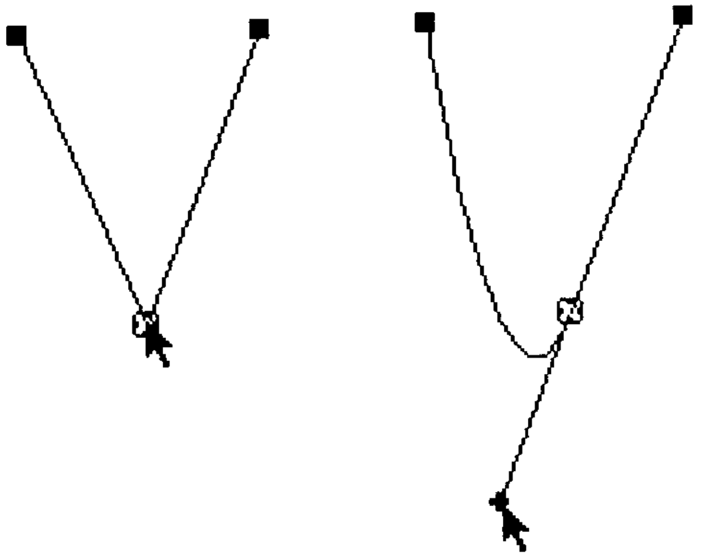


Movement is constrained to the slope of the line

7

Dragging a tangent point

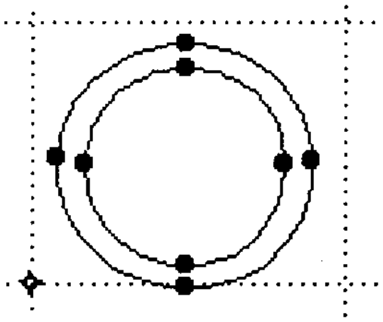
A tangent point's BCPs always constrain to the tangent (that is why they are named *tangent points*). Consequently, a tangent point's BCP can never be moved away from its tangent line. Moving the BCP will not change the shape of the curve. The Option key can be used to select the BCP that lies on top of a tangent point.

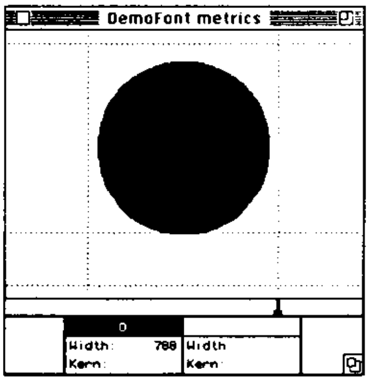


Path directions and fills

We already know that characters consist of open or closed paths. When PostScript generates output on a printer, it fills the outline of a character with a black bitmap. The standard PostScript filling technique is called a ***winding number fill*** which is referred to in Fontographer's character information box as a "Normal" fill. This relies on one path being described in a clockwise direction and the other path being described in a counterclockwise direction. A point is outside, and thus not filled, if a line away from that point in any direction crosses exactly as many counterclockwise paths as it crosses clockwise paths. For the case of the "O," the outer path should be drawn clockwise and the inner path counterclockwise.

In this example, both paths have been set at a counterclockwise setting.



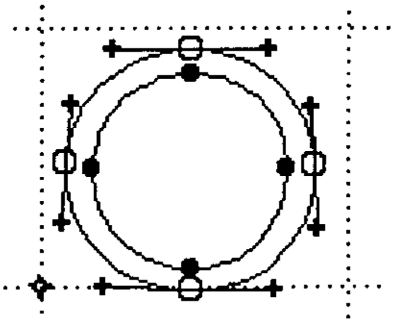


Width: 788
Kern:
Width
Kern

We know this because when we open the metrics window to preview our character, we see a filled outline.

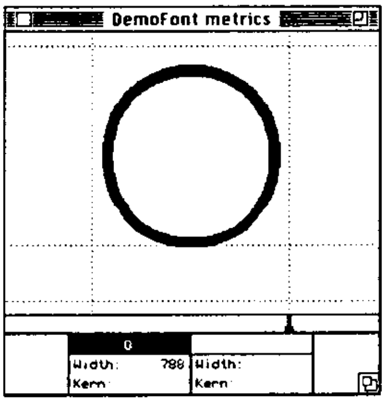
By selecting the outer circle's points and then choosing "Clockwise" from the Path menu, the character will display as desired in the metrics window.

- **Select all the control points on the outer circle by double-clicking on one of the points.**



- **Choose "Clockwise" from the Path menu.**

  The character now appears in its desired form in the metrics window.



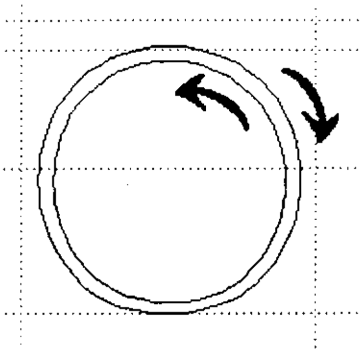
Width: 788
Kern:
Width:
Kern:

Note: For best hinting results, the outer paths should be *clockwise* and the inner paths *counterclockwise*. Choosing "Correct path direction" from the Point menu will do this for you.

Even-odd fill

The other filling technique is called an ***even-odd fill.*** An outside path is not filled until it crosses a path. The area that it crosses is filled; the next area the path crosses becomes unfilled, and so on.

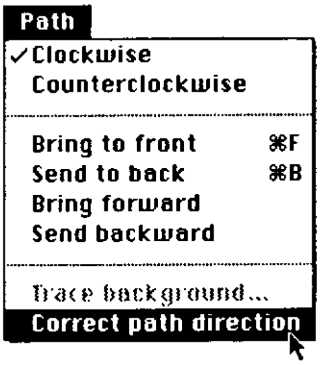
In the case of the "O," even-odd filling would give the desired result even if both paths were clockwise.



The current path direction, clockwise or counterclockwise, is shown in the Path menu. Click on the control point and choose "Clockwise" or "Counterclockwise" from the Path menu to change path direction. Path direction is only defined on paths with two or more points.

Correct path direction

Path directions must be correctly set for proper bitmap hinting of the bitmaps. Choosing "Correct path direction" tells Fontographer to examine all the selected characters and, if necessary, automatically reorder their path directions.



The outer path will be set to clockwise, the inner path to counterclockwise. Fontographer automatically (but temporarily) reverses these when required (for instance, when generating Type 1 fonts). If your path directions are correct, Fontographer will do any reversals automatically as required.

Note: You can stop this operation at any time by typing ⌘ and a period.

Reversing path directions

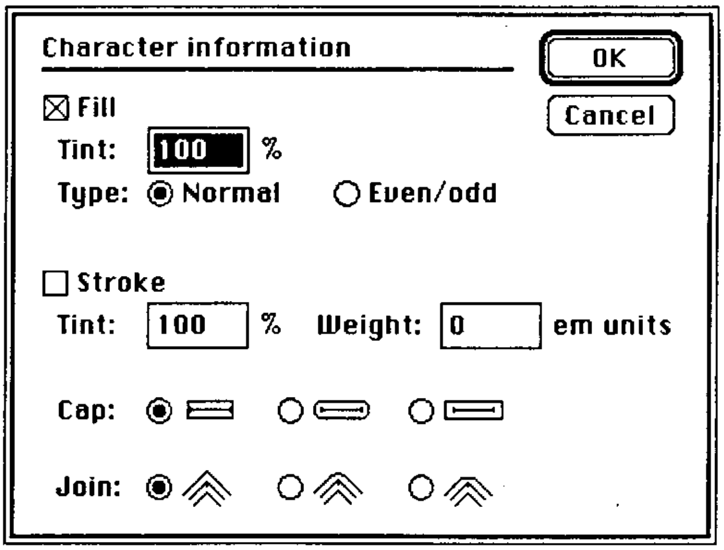
Fontographer also allows you to specify a reverse path direction (for plotters, signcutters, etc.). By holding down the Option key when you select "Correct path direction," the paths will be reversed. For example, outer paths will be counterclockwise and inner paths will be clockwise.

Character information

To check the characteristics of the "O," open the "Character information" box.

- **Choose "Char info. . ." from the Edit menu.**

  When the "Character information" dialog box appears, we see that the character has a 100% fill (which means that its paths are filled with black).



Character information

☒ Fill

Tint: 100 %

Type: ● Normal ○ Even/odd

☐ Stroke

Tint: 100 % Weight: 0 em units

Cap: ● ○ ○

Join: ● ○ ○

Before we change any of the characteristics, it is important to know more about these values.

Outline vs. stroked characters

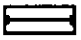
Up until now, we have described outline characters. You construct the letter by drawing a path around the character's perimeter. Fontographer also creates a different type of character which is sometimes very useful. ***Stroked characters*** are constructed by drawing just the centerline path. PostScript draws these characters by sweeping a pen along the path. The pen has a width called the stroke weight which is made up of em-units. As PostScript sweeps along the path, it paints a line that many units wide.

Any character which is constructed entirely of equal weight strokes can be drawn as a stroked character. For example, the letters in the Altsys logo and the Fontographer logo (at the bottom of this page) are drawn as stroked characters. These are Type 3 fonts, since Type 3 fonts are best suited to create stroked characters. You must create a Type 3 font if you want stroked characters.

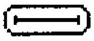
PostScript gives you complete control over the type of pen which draws stroked characters. In addition to its width, you can specify its appearance at the ends of the strokes and its behavior at bends. The appearance at the ends is called the ***end cap*** type, and the behavior at bends is called the ***line join*** type.

End caps

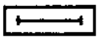
There are three types of ***end caps***: butt, round, and square.



Butt end caps stop right at the end point of the line.



Round end caps project a semicircle out from the end point. This semicircle has a diameter equal to the stroke weight and center point at the end point.



Square end caps project out one half the stroke weight in the direction of the path.

There are three types of line joins: miter, round, and bevel.

Miter joins extend the outer edges of the lines until they meet at an angle, like the corners of a picture frame.

Round joins draw a circle with diameter equal to the stroke width at each bend.

Bevel joins are drawn as if the joining segments were stroked with butt cap ends and the resulting notch filled with a triangle.

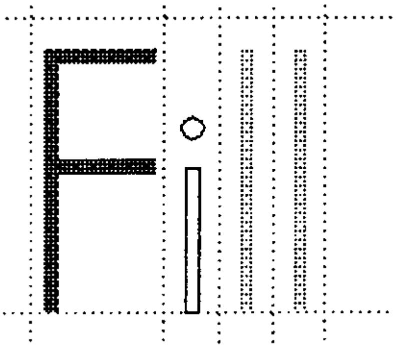
Changing character information

Often you want to change or check some of the character's attributes. Character attributes include such things as stroke width, fill percentage, type of filling, and information about how lines join and end.

To change character information, choose "Char info..." from the Edit menu.

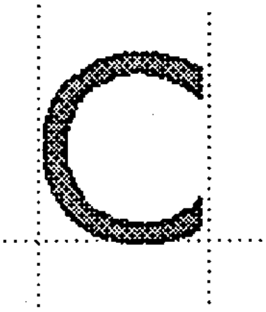
Changes to the character's tint, weight, stroke, cap and join type can be made from the font window, the character window, or the metrics window. We can change the fill to a lower percentage, which will make the character a shade of gray. Or you can click on the "Fill" box to turn the filling function off and click on the "Stroke" box to activate it and make this an "Outlined" character. The stroke's shading can also be controlled by the tint box.

In this example, we have set the character fill for the "F" at 80%. For the "i" we chose no fill and a stroke tint of 100%. The "l" was set at a fill of 20% with no stroke. The combinations Fontographer offers are endless.



A character can be both stroked and filled.

For example: This character is filled with 60% gray and stroked with 90% gray at a weight of 10 em-units.



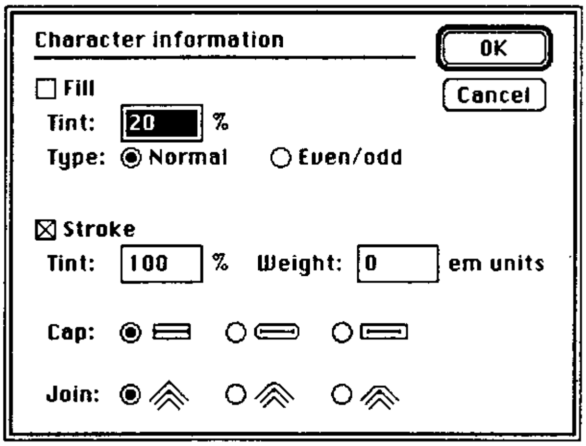
Note: You must generate Type 3 fonts if you have characters such as these, since Type 1 fonts do not allow filled and stroked characters in the same font.

Previewing a character

Once you have set the specifications in the character information box, you can preview the filled character in the metrics window.

To view a character unfilled (outlined)

- Choose "Open metrics" from the File menu.
- Choose "Char info..." from the Edit menu.
- Click on the "Fill" box (the "x" disappears).
- Click on the "Stroke" box (an "x" appears).



Character information

☐ Fill

Tint: 20 %

Type: ● Normal ○ Even/odd

☒ Stroke

Tint: 100 % Weight: 0 em units

Cap: ● ○ ○

Join: ● ○ ○

The metrics window will change from a filled to an unfilled character.

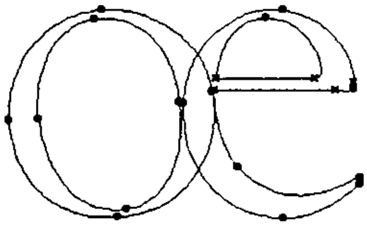
Remove overlap

Choosing the "Remove overlap" option allows you to remove overlapping areas in characters like the one shown in our metrics window example below:

Note: This command is only enabled in the character edit window.

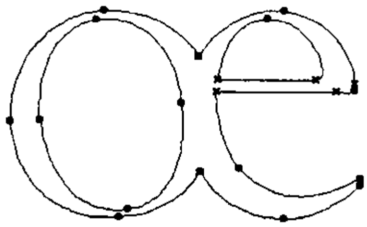
To remove overlapping areas:

- Select the character you wish to remove the overlapping areas from.



- Choose "Remove overlap" from the Special menu.

Fontographer removes the overlapping areas.



Note: You'll get better results if you set the path for a normal fill. *If the path has an even/odd fill, Fontographer will merge the characters but you will need to remove the overlapping segment(s) manually.* Removing the overlap(s) may result in faster printing fonts and help the hinting process. If you have difficulty removing overlapping segments, try correcting the path direction for the character.

Pasting EPS outlines from the clipboard

You can paste your FreeHand and Illustrator images directly into the character edit window.The following procedure works best in MultiFinder. You can also use the Scrapbook.

- **While you are in FreeHand or Illustrator, select the graphics you with to copy, then press the Option key and select "Copy" from the Edit menu.**
- **In Fontographer, select a character slot and "Paste."**

The path data will be pasted into your character and scaled to fit the em-square.

Holding down the Option key while pasting the EPS file will scale the outline from the baseline to the ascent instead of the normal method of fitting it to the em-square.

Note: This option extracts only the outline path data (i.e., points). It ignores bitmap PICT data, TIFFs, text and special effects.

Tracing

The ***auto-trace*** option is one of Fontographer's most advanced features. You can scan an image, logo, or character, and save it in the Clipboard in PICT format. You may also use any PICT format artwork for the base design. "Paste" the image into the background plane and it will be shown as a grayed-out image, usable as a background template for tracing or auto-tracing your character. Background proportions can be established quickly and accurately so the character can be auto-traced in the foreground plane and fine-tuned (if necessary) with the standard drawing tools.

Pasting an image

It is fairly simple to paste an image into the background. However, there are a couple of points that need to be considered.

Copy or paste your image (MacPaint, MacDraw, scanned image, etc.) into your Scrapbook. If you are running in MultiFinder, you may quickly "Copy" and "Paste" via the clipboard.

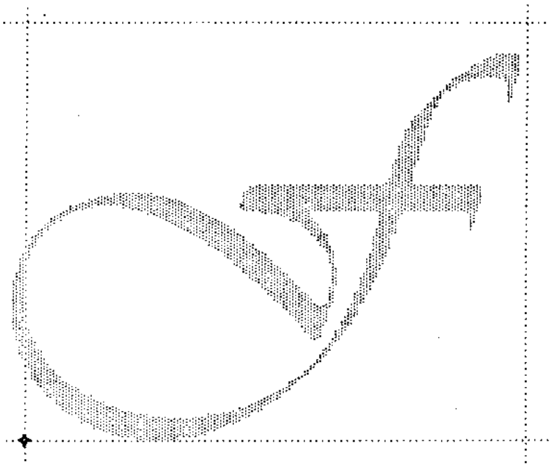
All of your characters must be the same size *before* you paste them into the scrapbook! If you neglect this your background images will be in varying sizes, and you will have to spend time making adjustments. Therefore, make all size adjustments, in the scanning or drawing program of your choice, ***before*** you paste the image into the background. See Appendix C for one technique that guarantees proportionally sized bitmaps.

To paste an image into the background plane:

Fontographer automatically pastes all PICT images into the background plane.

- **"Copy" the image from the scrapbook or drawing and "Paste" into the background.**

Anything in the background is always shown as a grayed-out image (like the one below) so that it can be easily distinguished from the foreground layer.



Note: Images pasted into the background layer are automatically sized to fit the em-square. If you hold down the Option key, the image will be pasted into the background at its original size.

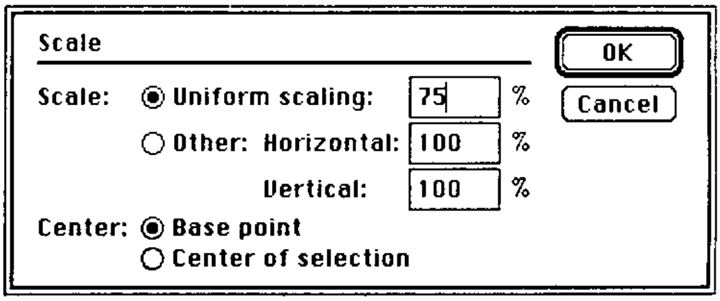
You can move the image into place by positioning the pointer inside the image, then dragging it to the new location.

To resize a background image:

- Click on the background image to select it.

  A gray boundary box around it indicates that it is selected.

- Choose "Scale" from the Special menu and scale the image by entering a figure in the "Scale" box.



Scale

Scale: ● Uniform scaling: 75 %

○ Other: Horizontal: 100 %

Vertical: 100 %

Center: ● Base point

○ Center of selection

You can reduce or enlarge the image proportionately by selecting "Uniform scaling" and entering the percentage.

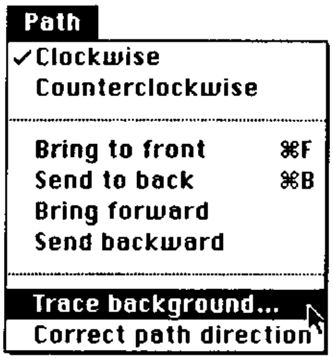
OR

- Scale manually by selecting the background image and dragging on one of its corners to enlarge or reduce.

Tracing an image

Once the image is positioned and sized properly, it may be outlined with the "Trace background..." option.

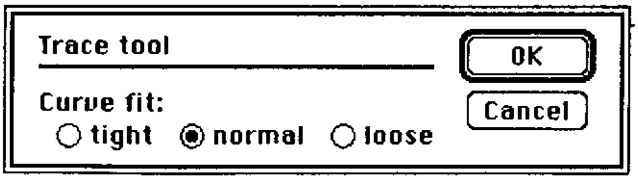
- Choose "Trace background..." from the Path menu or type Shift-⌘-t



Note: When you choose Shift-⌘-t to auto-trace, Fontographer uses the last curve fit parameter you chose.

Tracing options

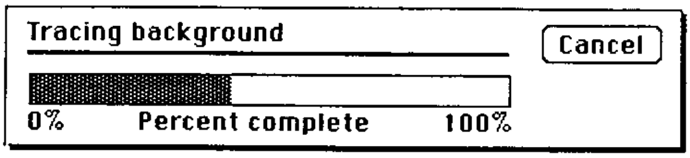
When the "Trace tool" dialog box appears, you have the option of choosing a curve fit of "tight," "normal," or "loose." The default selection is "normal."


Trace tool

Curve fit:
○ tight ● normal ○ loose

The tighter you set a curve fit, the more points will be placed on your character. By having more points, the tracing will more closely resemble the original image. However, too many points will consume unnecessary memory without appreciably improving the accuracy of your path. It is better to use as few points as possible to get the shape you desire.

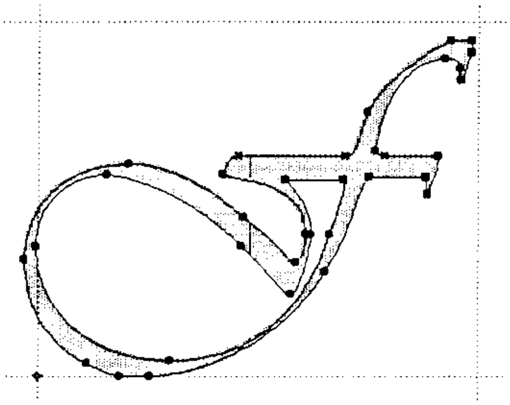
When the "Tracing background" dialog box finishes generating, you will have a completely traced character in the character edit window.



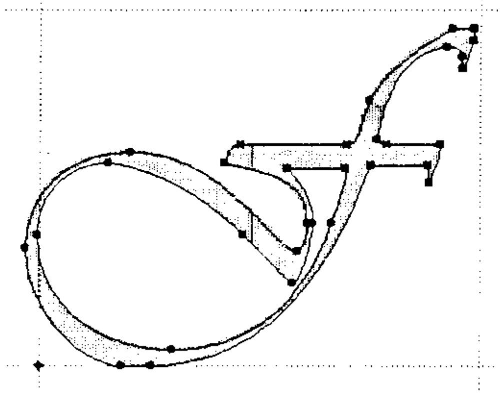
It may take a few moments to trace the character. You can cancel the tracing operation at any time by clicking on the Cancel button or or by typing ⌘ and a period.

As you can see from these examples, "Normal" is generally the best all-purpose selection. "Tight" would be a good selection for more intricate design, although for the purpose of the "F" it is not necessary; while "Loose" would be good for characters with straight angles (such as block letters) and poor quality scans.

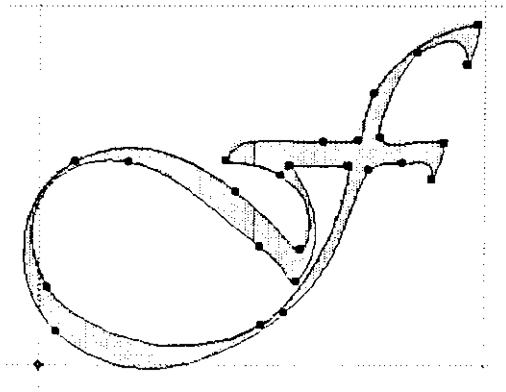
Tight



Normal



Loose



When you are through with the background image, you can select the gray character and delete it. Background images may take large amounts of space to store. They are saved with the font and can consume disk space very quickly if they are not cleared when they are no longer needed.

Note: You may remove extra points inserted by the trace function by selecting those points and choosing "Merge point" from the Point menu or typing ⌘M.

Setting guidelines

The guidelines plane is used to construct the drawing guidelines which are common to every character of a font (such as the x-height line). The guidelines plane is similar to the background plane, except it is drawn in a lighter shade of gray and appears behind every character of the font. Guidelines are drawn in a light gray pattern so they may be distinguished from the foreground and background images.

Guidelines may be edited from any character. Change to the guidelines drawing plane by clicking on the plane indicator until the dashed guideline indicator is active. Or you can type "g" when the lock icon is in the locked position.

When the guideline plane is active, guidelines may be edited or drawn with the standard drawing and editing tools. Straight horizontal or vertical lines look best, but curved lines may be drawn if required.

Changes made to the guidelines plane are reflected in every character in the font. You may "Undo" changes made to the guidelines plane just like you would do with an ordinary character.

Setting guidelines from the "Font attributes" menu

Ascent and descent are already defined but can be reset by choosing "Font attributes..." from the Edit menu and typing the values in the Ascent and Descent boxes.

Adding new guidelines

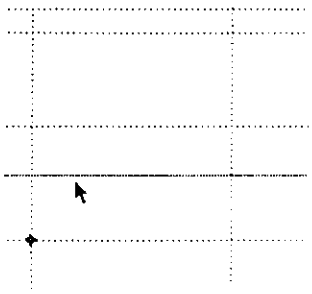
Additional guidelines can be set by drawing them into the guidelines plane.

- **Select the guidelines plane.**
- **Click on the drawing tool of your choice to place the new guideline.**

  These guidelines can be removed simply by deleting their points.

OR

New guidelines can also be set by dragging vertically from the baseline or horizontally from the origin line.



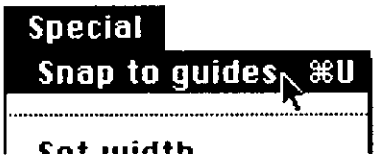
These guidelines can be removed by dragging them back into the line they originated from.

Note: Due to interactions with the gray pattern used in the guideline plane, some angles may not show up in certain positions. Lines at certain angles interact with the gray pattern to produce either solid lines or invisible lines. Horizontal and vertical lines are always patterned properly and are normally the only types of line needed for guidelines.

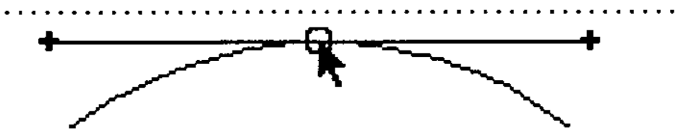
Snap to guides

Set some guidelines in the guidelines plane and check the "Snap to guides" option from the Special menu. When points are within three pixels of the guideline, they snap or align to that guideline.

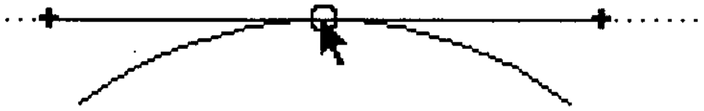
- **Choose "Snap to guides..." from the Special menu.**



- **Move the control point toward the guideline.**



When the image is within three pixels, the point will align with the guideline.

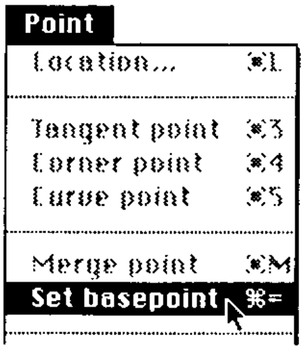


The "Snap to guides…" option may be turned on or off anytime during editing.

7 Setting the basepoint

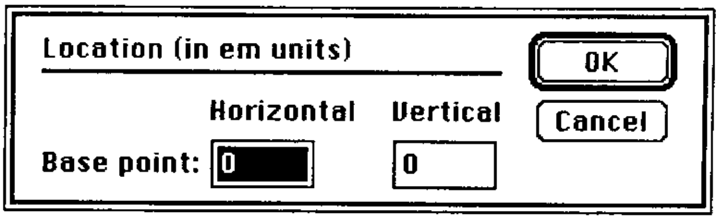
The *baseline* is the line upon which the letters sit. The baseline position is always at a vertical location of zero. The dot at the intersection of the origin line and baseline is the basepoint.

The *basepoint* is used to accurately and quickly align points and characters. The basepoint is generally at the origin, but may be positioned anywhere within the em-square of the font. It may be moved as needed by selecting the basepoint tool and dragging it to a new location, or by selecting a character point and choosing "Set basepoint" from the Point menu to attach the basepoint to that point.



In the position display, distance from the basepoint is continuously updated as the pointer moves within the drawing area. This on-screen ruler makes it easy to measure character parts. Just place the basepoint on a reference point of the character and watch the position display as you move the pointer. Horizontal or vertical alignment of points is very easy to check; set a basepoint on one point then drag the other until the horizontal or vertical delta is zero.

A quick way to move the basepoint is to choose "Set basepoint" from the Point menu. Select a point, then perform this operation to instantly move the basepoint to that point location. You can then make measurements using that point as a reference.



Base point: 0 0

Fontographer allows you to set each character's basepoint differently.

Character spacing and width

Spacing is basically determined by two factors: ***offset*** and ***width***. Offset is the distance between a character's origin and leftmost part of its image. It contributes to the space that exists between a character and the character drawn to its left. Width, on the other hand, is the adjustment applied to the current position after a character is drawn. It affects the spacing between a character and the one to its right. The width of a character can not be less than zero. Thus, the total space between two characters depends upon the width of the left character and the offset of the right one. Both the offset and width are expressed in the same arbitrary coordinate space that the character images use. This allows them to be scaled to any point size.

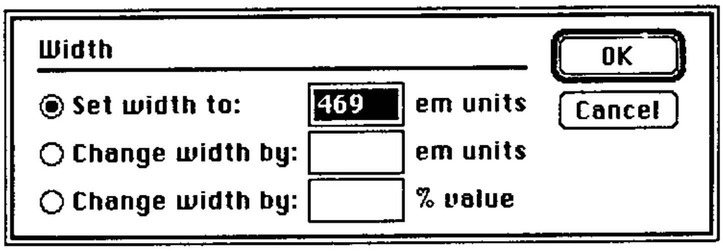
To interactively change character width:

- **Select the width tool.**
- **Drag the width line to the desired position; then release the mouse button.**

  The horizontal value in the position display can be used to determine when the desired width is reached. You can use demagnification (by pressing the Control key) to allow fine adjustments to the width.

Character width can also be set by choosing "Set width... from the Special menu.

When the "Width" dialog box appears, the width can be set or changed by percentage or specific em-units.



Width

● Set width to: 469 em units

○ Change width by: em units

○ Change width by: % value

Note: Clicking on the width tool while the Option key is held down will automatically bring up the "Width" dialog.

To adjust a character's offset:

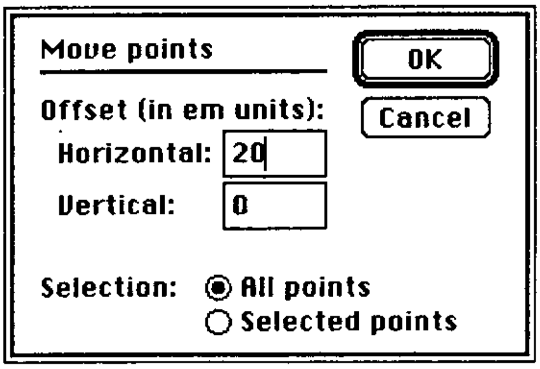
- Select the pointer tool from the tool palette.
- Select all the points.
- Drag the points to the position at which the desired offset is achieved, then release the mouse button. You may use demagnification while dragging by pressing the Control key.

OR

- Choose "Move..." from the Special menu.

  The "Move points" dialog box offers the option of moving "All points" or the "Selected points." When you use the "Selected points" option, only the currently selected points will be moved.

  Enter the desired change to the offset as the "Horizontal" move distance. Leave the "Vertical" move distance set to zero.



Move points

Offset (in em units):

Horizontal: 20

Vertical: 0

Selection: ● All points ○ Selected points

- Click "OK."

Applying special effects

Included within Fontographer is a set of capabilities for modifying character images to produce interesting special effects. These effects are achieved by applying mathematical transformations to the points which define the image of a character. You can also apply effects to background PICTs.

You may use Fontographer's special effects from either the font or character windows. When used from the font window, an effect is applied to all points in each of the selected characters. On the other hand, in a character window, an effect is applied only to the selected points. If there are no selected points, the effect applies to the entire character. This permits much greater control over the operation of the effect.

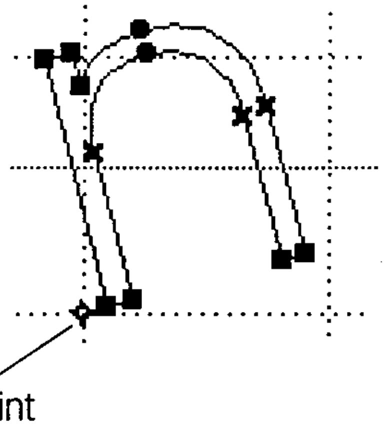
The special effects are all located in the Special menu. You can apply an effect by choosing it from this menu. Some of the effects require additional information in order to perform their operation. For example, the "Rotate..." effect requires a rotation angle. You will be prompted for this information after you select the effect.

Reference points

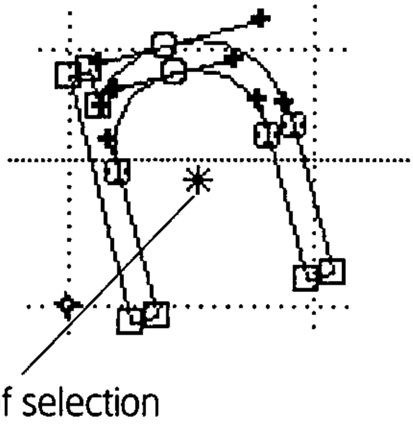
Most of the special effects apply their transformation relative to a location called the reference point. The location used for the reference point varies with the circumstances. If the operation is issued from the font window, the basepoint within each character is used as the reference point. When an effect is performed within a character window, the location used for the reference point depends upon whether or not any points are selected. If points are selected, their center of gravity may be selected as the reference point. If no points are selected, the location of the basepoint may be used as the reference point.

These samples make it easier to understand the difference between the basepoint and the center of selection.

In our first example, the "n" was rotated 15 degrees from the basepoint.



In our second example, all the points were selected and the "n" was rotated 15 degrees from the center of selection.



The remainder of this chapter describes Fontographer's special effects and explains how to use them.

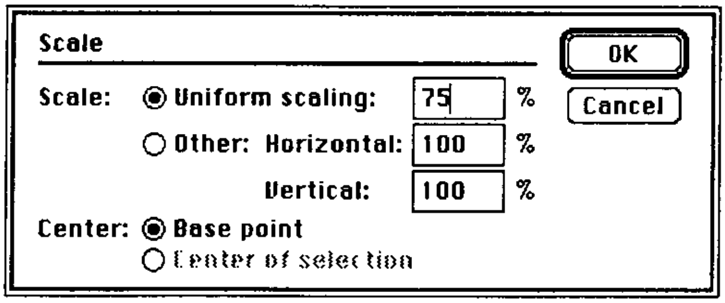
Scale

The "Scale" command is used to increase or decrease the size of an image by a specified scale factor.

This is achieved by adjusting the distance between the selected points and the reference point. For example, doubling the size of the image would require a scale factor of 200%, while halving it would require a scale factor of 50%.

To scale selected items:

- Choose "Scale..." from the Special menu.
- Enter the percentages to scale the figures.

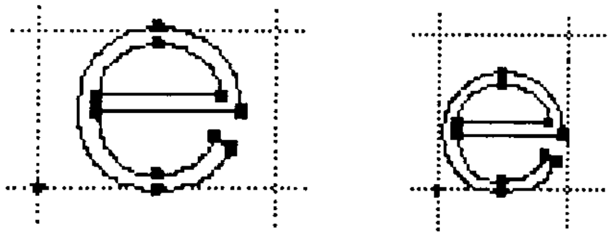


Scale

Scale: ● Uniform scaling: 75 %
○ Other: Horizontal: 100 %
Vertical: 100 %
Center: ● Base point
○ Center of selection

- Click "OK" to perform the scaling.

"Uniform scaling" scales the entire image uniformly. For instance, if you select a character and enter a scale factor of 50%, the image will be reduced to 50% of its original size (both horizontally and vertically).



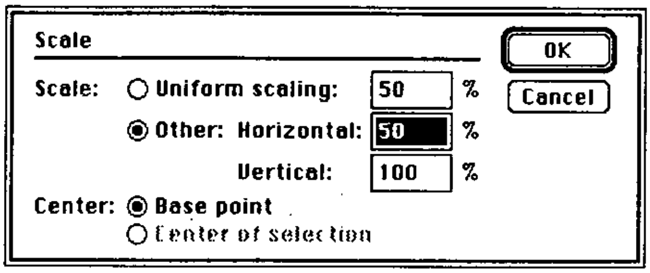
Choosing a scaling option of "Other" allows you to scale an image either horizontally or vertically independent of each other.

For instance, if you select "Horizontal" and enter a scale factor of 50%, the image will be reduced horizontally by 50%.

- **Choose "Scale" from the Special menu.**

- **Enter 50 in the "Horizontal" box.**

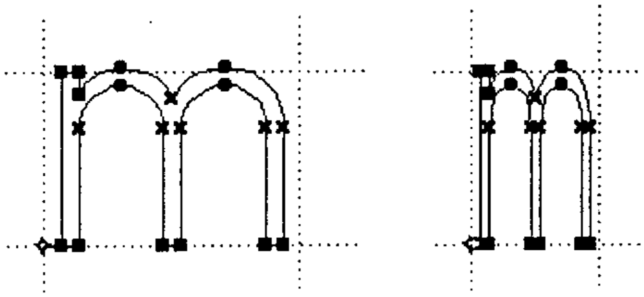
  If you don't want to change the vertical size; make sure the "Vertical" size box reads 100% to keep the vertical size the same.



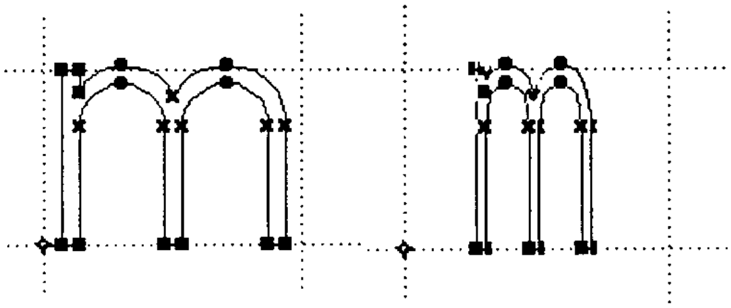
Scale

Scale: ○ Uniform scaling: 50 %
● Other: Horizontal: 50 %
Vertical: 100 %
Center: ● Base point
○ Center of selection

Fontographer will scale the character horizontally by 50%. Basically, this squeezes our "m" into a narrower space.



If you select all points before scaling and follow the above instructions, clicking on the "Center of selection" button will perform a reduction like the example below.



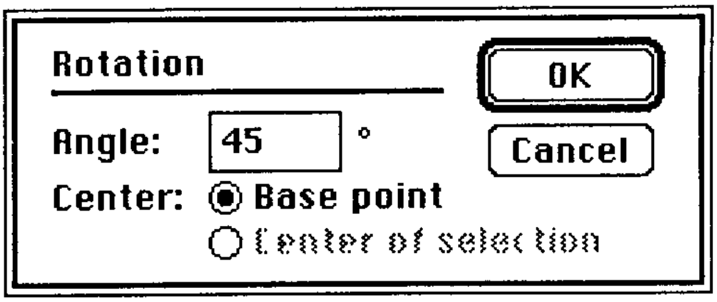
It is easy to see the difference in results when we perform any effect based on the "Center of selection" or "Basepoint."

Rotate

The "Rotate..." command is used to rotate the image a specified number of degrees. Choosing this option rotates the selected points about the reference point by a specified angle. Positive angles indicate a counterclockwise rotation, while negative angles specify a clockwise rotation.

To rotate the selected items:

- Choose "Rotate..." from the Special menu.
- When the dialog appears, enter the rotation angle in degrees.



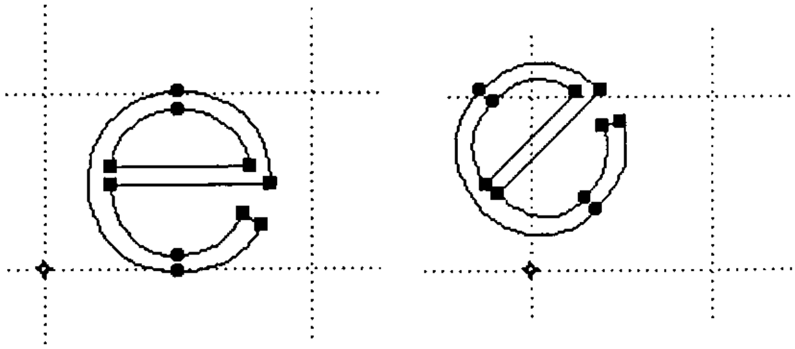
Rotation

Angle: 45 °

Center: ● Base point

○ Center of selection

- Click "OK" to perform the rotation.

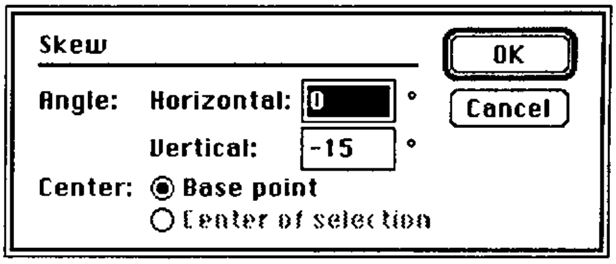


Skew

The "Skew..." command performs an oblique transformation on the image. For example, vertical skewing may be used to create italics. Skewing is specified as horizontal and vertical angles. Italics are normally skewed vertically by -15 degrees.

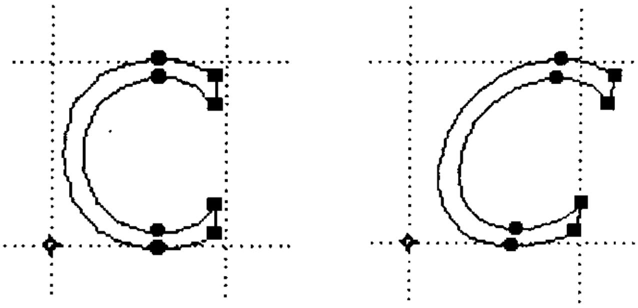
To skew selected items:

- Choose "Skew..." from the Special menu.
- When the dialog appears, enter the skew angle in degrees.



Angle: Horizontal: 0 °
Vertical: -15 °
Center: ● Base point
○ Center of selection

- Click "OK" to perform the skewing.



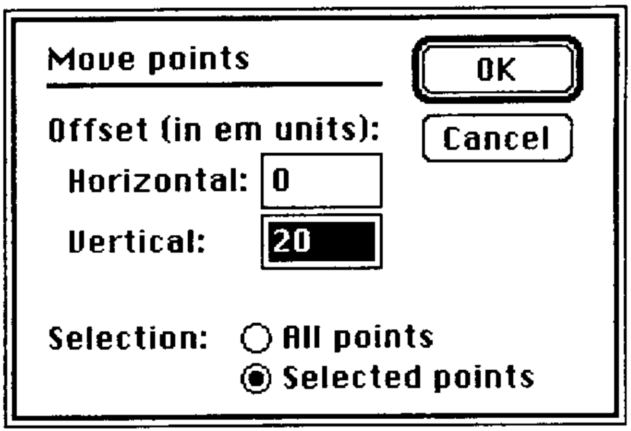
Scanned images may sometimes be slightly misaligned. Skewing them by a small amount may give better results. Go to the background plane, select the image and apply the "Skew" option.

Move

The "Move..." command displaces the image by a specified horizontal and vertical amount.

To move selected items:

- Choose "Move. . ." from the Special menu.
- When the dialog appears, enter the amount to move the image.



Move points

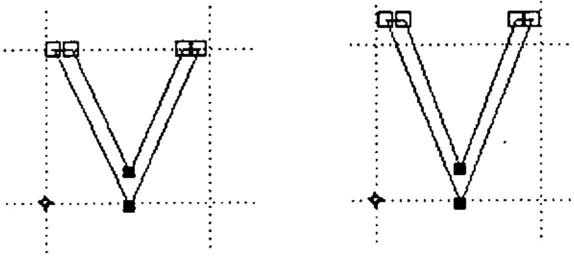
Offset (in em units):

Horizontal: 0

Vertical: 20

Selection: ○ All points ● Selected points

- Click "OK" to perform the move.



Flip

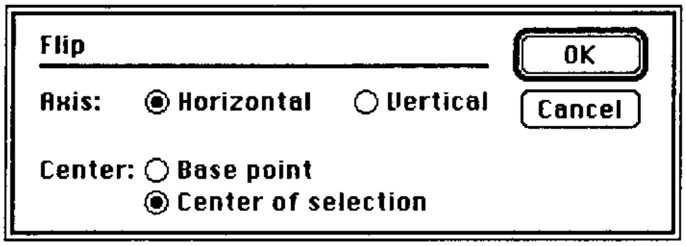
The "Flip..." command can be used to flip the image to the opposite side of an imaginary horizontal or vertical line.

Flip Horizontal

This effect repositions the selected points to the opposite side of a vertical line drawn through the reference point. The points maintain their original distance to this line.

To flip the selected items horizontally:

- Choose "Flip..." from the Special menu.
- When the dialog appears, click on the "Horizontal" radio button.

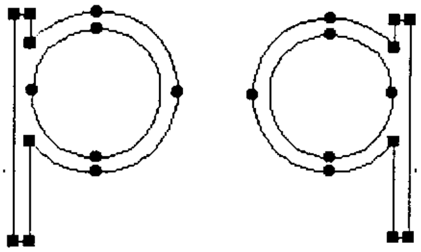

Flip

Axis: ● Horizontal ○ Vertical

Center: ○ Base point
● Center of selection

- Click "OK" to perform the horizontal flip.

As you can see in this diagram, the "p" can be changed to a "q" quite easily by using the "Horizontal" flip command.



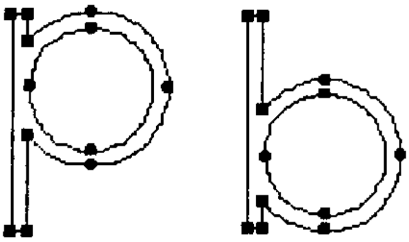
Flip Vertical

This is similar to "Flip Horizontal" except that the selected points are flipped to the opposite side of a horizontal line drawn through the reference point.

To flip the selected items vertically:

- Choose "Flip. . ." from the Special menu.
- Click on the "Vertical" radio button.
- Click "OK" to perform the vertical flip.

As you can see in this diagram, the "p" can be changed to a "b" quite easily by using the "Vertical" flip command.



Expand stroke

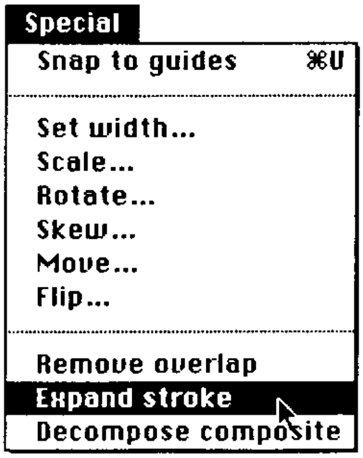
The "Expand stroke" command is used to expand stroked characters (such as Courier) into contoured (outline) or filled characters.

Note: This command is only enabled in the character edit window.

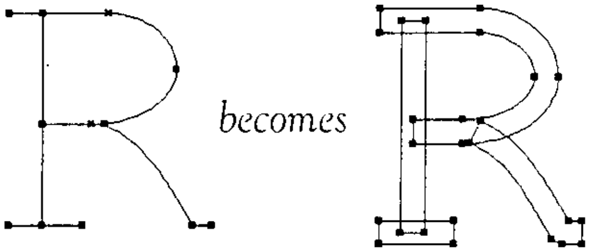
To expand the stroke width:

- Choose "Character info" from the Edit menu.
- Set the character stroke weight.

  If the stroke width in the "Character information" dialog is set at 0, this option will have no effect. In our example, we set the stroke width to 60 em-units. You can also specify the cap and join information in the "Character information " dialog.
- Choose "Expand stroke" from the Special menu.



The character will be changed from a stroked character to a outlined character.



Note: You may apply the "Correct path direction" and "Remove overlap" commands to get a simpler outline of the character.

Chapter Eight

The Metrics Window

The *metrics window* is used to preview the character and set character spacing and kerning pairs. While it is possible to get a rough approximation of the proper spacing using the tools in the character window, accurate adjustment of metrics requires that characters be seen in context (i.e., adjacent to other characters). Fontographer provides this special window to view ***intercharacter spacing***. The metrics window displays several characters simultaneously and presents them as accurately as possible on the screen. This preview shows the character fill (either black or gray), as well as line caps, joins, miter limits, etc. While it may still be necessary to generate some print samples to achieve optimum results, this window makes it possible to set the width and kerning pair information interactively.

Opening a metrics window

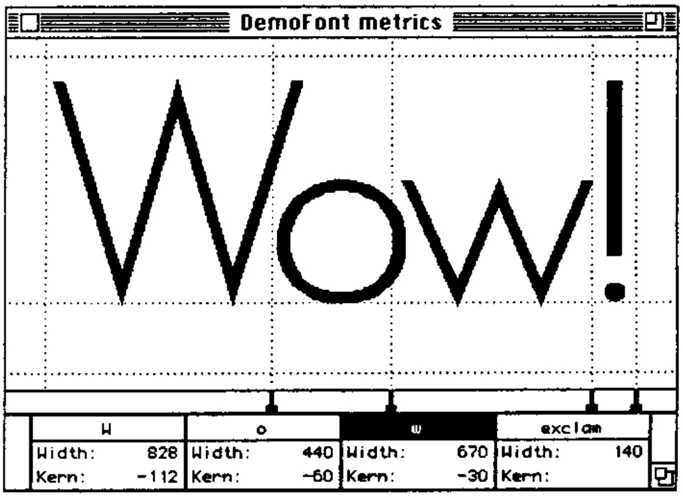
The metrics window can be opened from any window. The character being edited in that window will occupy the second entry in the metrics window. The first and third characters default to an empty status. This is useful for those instances where you wish to see how a character is spaced in relation to the characters immediately before and after it.

To open a metrics window from the font window:

- Select a character and choose "Open metrics" from the File menu or type ⌘K.

To open a metrics window from a character window:

- Choose "Open metrics" from the File menu or type ⌘K.



W	o	w	exclam
Width: 828	Width: 440	Width: 670	Width: 140
Kern: -112	Kern: -60	Kern: -30	Kern:

The metrics window has a standard title bar, zoom box, and close box. The title of this metrics window is the name of the font whose metrics are being adjusted, followed by the word "metrics." There are no scroll bars in this window, but the grow box in the lower right hand corner allows you to enlarge or reduce its size.

Character display

The top portion of the metrics window is the *character display* area. It is here that you can see the characters being adjusted in direct relation to one another. The characters are displayed in the largest size that will fit in the window. Dotted horizontal lines mark the position of the font's ascent, descent, and baseline. Dotted vertical lines show the origin and width of each character.

Width indicators

Directly below the character display is a small rectangular area which contains a set of ***width indicators*** or ***T-bars***, one for each character displayed. These indicators, which are shaped like an upside-down "T," mark the position of each character's width (or kern-adjusted width) and can be used to adjust width and kerning pair information.

Metrics display area

The bottom part of the window contains the ***metrics display area***. This area is divided into entry boxes, whose number is determined by the size of the window. The top section of the entry box may be empty or filled with the character name assigned to that slot. These characters are displayed in the same order that they appear in the character display. Spacing for any combination of characters can be examined by assigning the characters to consecutive entries in the character display. The width of each character (and kerning, if any) is displayed directly below the character name.

Selected entry

One of the characters in the display area is the ***selected entry***. That character's name label is highlighted in the metrics display area. A character must be selected in order to make any adjustments to it. Additionally, an entry must be selected to replace or change the character assigned to that entry box.

To select an entry:

- Position the pointer on the label of the entry you wish to select, and click.

To select another entry:

- Position the pointer on the label of the entry you wish to select and click to highlight it. Type the new character.

OR

- Repeatedly press the Tab key until the desired entry is selected.

To select existing entries:

- Repeatedly press the Tab key while you hold down the Shift key.

  This will select entries to the left of the currently selected window.

To change the character assigned to an entry:

- Select the entry you wish to change.
- Type the desired character on the keyboard.

  Note: You may also use the "Next char" or "Prev char" from the View menu to switch to the next or previous character.

Undo and Redo

In the metrics window, the "Undo" and "Redo" commands only affect the currently selected character and actions to it.

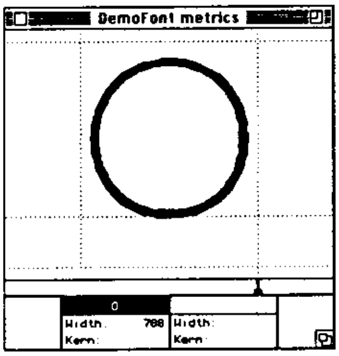
Previewing a character

When you create a character image, you might need to see how it's going to look when it's filled. This may be necessary to select the correct filling mode (even/odd or normal), or to verify that the paths are drawn in the correct direction (clockwise or counter-clockwise). It may also be necessary to adjust the shape for optimum appearance (for example, balancing the light and dark areas). You could accomplish this by making print samples. However, you can also preview your characters in the metrics window.

To preview a character:

- Choose "Open metrics" from the File menu or type ⌘K.

  The metrics window displays a filled character.



O

Width: 788

Kern:

Width:

Kern:

Changing character information

Information such as character fill, type, stroke, and weight can be set or changed from the metrics window. The "Character information" box (which we covered in detail in Chapter Seven) can be opened by choosing "Char info..." from the Edit menu. Fontographer updates the character information each time you alter the character in the metrics window.

Spacing

The term *spacing* is used to describe the amount of unused area that exists between character images drawn on the same line. In order to understand how spacing is controlled, you need to know a little about how characters are displayed.

To display a line of text, the image corresponding to each character in the line is drawn on the output device. The character images are all aligned so that their baselines (vertical position zero in the character's coordinate system) lie along the same imaginary line. Each image is displayed with its origin (horizontal position zero) aligned to the current position along that line. After each image is drawn, the current position is adjusted by the character's width (potentially zero, as in an accent character) before the next character is drawn.

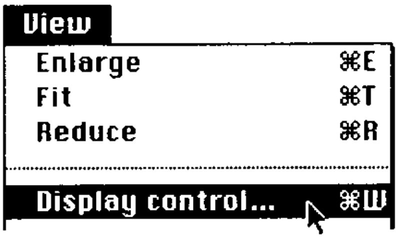
Showing several characters makes it easier to see spacing interrelationships. A common baseline and width indicator line for each character can be useful in making adjustments.

Guidelines

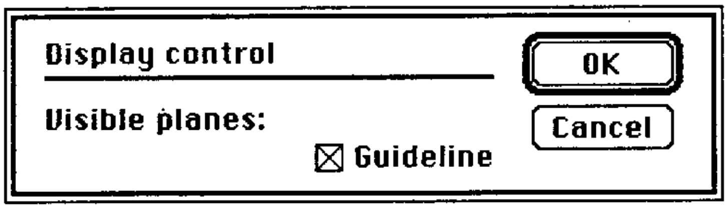
The ascent, descent, baseline, and width indicator lines for each character automatically display as dotted lines in the metrics window.

To hide guidelines:

- Choose "Display control..." from the View menu or type ⌘W.



- Click the "Guideline" box to uncheck it.



Visible planes:
☒ Guideline

Adjusting character metrics

Each entry in the adjustment area has a T-bar to control spacing adjustments: Width and Kern. The current value of each entry is displayed; empty slots have no values or T-bars.

Character width

Width is the moveable vertical line which specifies the width of the character. In the character edit window, the width is set with the width indicator. The width can be adjusted in the metrics window by dragging the T-bar left or right or by using certain keyboard combinations which are specified below.

Keyboard commands for changing character widths:

Using the left and right arrow keys will change the width of the selected character by one em-unit.

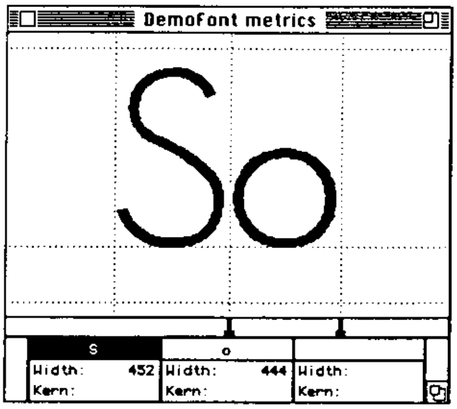
Holding down the Shift key while using left and right arrows will change the width in increments of 10 em-units.

Holding down the Control key while dragging the T-bar lets you constrain the width change of a character to a single em-unit.

To change character width:

In this example, we increase the character width of the "S" to 460.

- Select the character whose width you wish to change by clicking on it in the metrics adjustment area.



S	o	
Width: 452 Kern:	Width: 444 Kern:	Width: Kern:

- **Hold down the Shift key and press the right arrow key once.**

  The width increases in increments of 10 em-units each time the arrow is pressed while holding down the Shift key. The new width of the "S" width will be 462.

Now we'll decrease the width by using the left arrow key.

- **Press the left arrow key twice.**

  This reduces the width to 460.

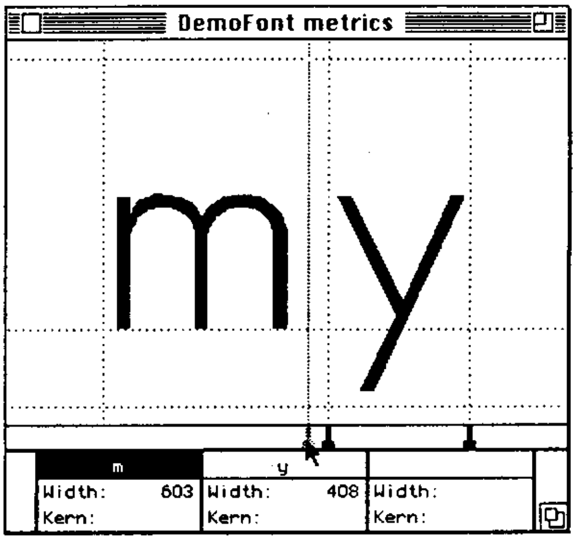
  Without using the Shift key, the right and left arrows change the width by one em-unit.

Our next example has some unnecessary white space; we can interactively change it.

We will adjust the width of the "m" by moving the T-bar.

- **Position the pointer over the T-bar and drag it to the left.**

  Adjust the T-bar until you are satisfied with the spacing of the "m."

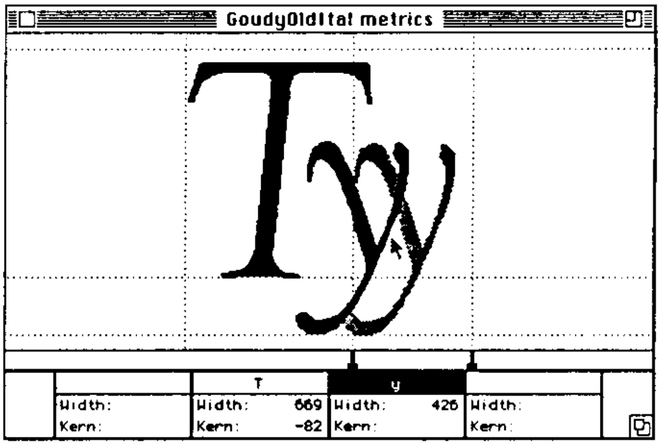


m	y	
Width: 603	Width: 408	Width:
Kern:	Kern:	Kern:

Moving a character

A selected character can be dragged horizontally to change its offset.

- Click on the character's name label.
- Position the pointer in the character display area and drag the character (indicated in gray in the illustration below) to the left or right.

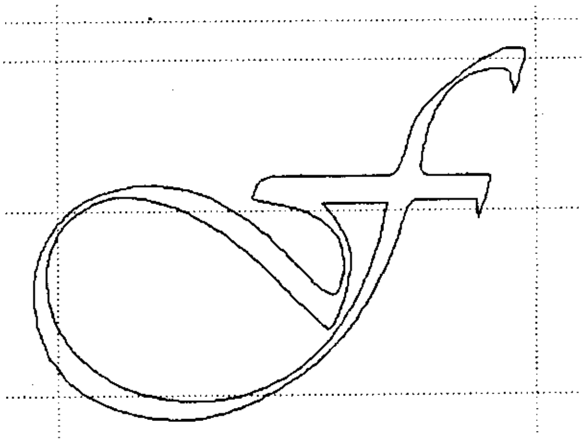


	T	y	
Width:	Width: 669	Width: 426	Width:
Kern:	Kern: -82	Kern:	Kern:

Adjust the character until you are satisfied with its positioning with respect to its origin.

Kerning

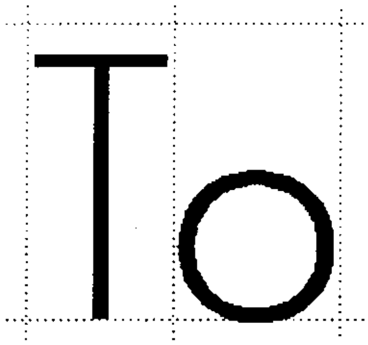
Kerning refers to the ability to reduce spacing between selected characters by projecting a letter into the previous or a following letter. If the image extends to the left of its origin (its offset is negative), the character is said to kern left. Similarly, if the image extends beyond its width, the character kerns right.



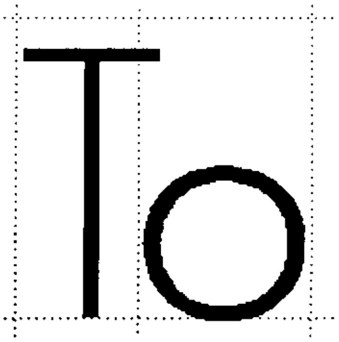
The capital "F" in this illustration kerns left, since the tail falls to the left of the origin line. Characters that kern right extend to the right of the width line. Italic characters normally kern both left and right. Fontographer allows any character to kern either left or right, or both.

Kerning pairs

Typographers noticed long ago that certain combinations of characters look better if the space between them is decreased. The word "To" below, provides a good example of a word with and without kerning. In the diagram on the right, the "o" is nestled under the cap of the "T" because it has been ***kerned.***



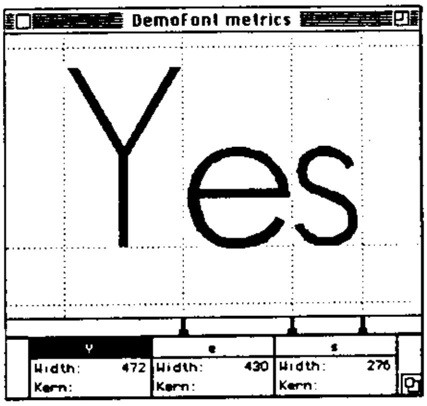
Without kerning



With kerning

Combinations of characters, like the "To," are often referred to as ***kerning pairs***. The offset and width affect the spacing of a character, no matter what character it is adjacent to. Fontographer allows you to specify a special adjustment to the spacing (either positive or negative) that applies whenever two particular characters are adjacent to each other. This capability allows you to add kerning pairs to your font. However, you should be aware that not all Macintosh software supports kerning.

In this example, the word "Yes" has no kerning applied to it. If the kerning value of a character is not zero, that character and the one to its right are defined as a kerning pair. There is no kern value in this example's metrics display area, which means the characters are not kerned. We will manually adjust the kerning of the "Y" and the "e," which will hereafter make them a kerning pair.



Y	e	s
Width: 472	Width: 430	Width: 276
Kern:	Kern:	Kern:

Adjusting kerning

Kerning pairs are set by holding down the Option key and dragging the width indicator (T-bar) of the left character of the pair. This sets an adjustment to the width which will be applied whenever this character and the character in the entry to its right appear together on the same line. Kerning can only be set if there is a character referenced in the entry to the right.

The kern value may be negative, but the sum of the kern and width values may not. If the kerning value of a character is not zero, that character and the one to its right are defined as a kerning pair. Change the kern value back to zero to remove that kerning pair.

Keyboard kerning commands:

Kerning can be adjusted by holding down the Option key while dragging the T-bars left or right or by using these keyboard combinations:

Using the Option keys with left and right arrows will change the kerning pair value by one em-unit.

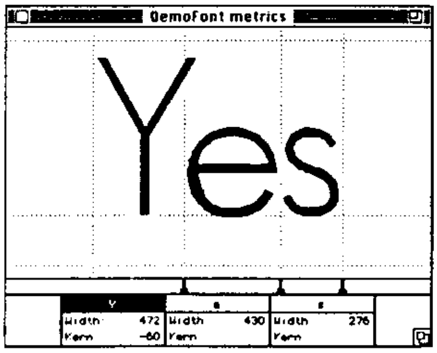
Using the Shift-Option keys with left and right arrows will change the kerning by 10 em-units.

Holding down the Control and Option keys while dragging the T-bar restricts the kerning change to a single em-unit.

Note: On certain keyboards (Macintosh Plus), the Shift, Option, and left and right arrow keys behave a little differently. You should use the Shift-Command arrow keys instead. This will change the kerning by ten em-units.

To adjust kerning:

- **Select the "Y" by clicking on it in the metrics adjustment area.**
- **Hold down the Shift and Option keys and press the left arrow six times.**

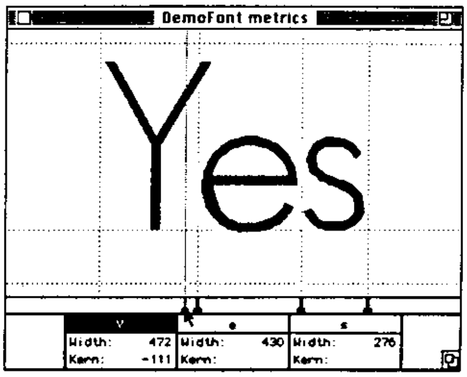


Y	e	s
Width 472 Kern −60	Width 430 Kern	Width 276 Kern

As you can see, the kerning was adjusted 60 em-units: 10 em-units for each time we pressed the arrow key while we held down the Shift and Option keys.

Now we'll use the Option key and the T-bar to adjust kerning one em-unit at a time.

- **Hold down the Option key, position the pointer over the T-bar and drag it to the left.**



Y	e	s
Width: 472	Width: 430	Width: 276
Kern: -111	Kern:	Kern:

As you can see, we adjusted the kerning to -111 em-units. You can manually adjust the T-bar until you are satisfied with the way the kerning pair looks.

You can also adjust the kerning one em-unit at a time by holding down the Control and Option keys and dragging the T-bar.

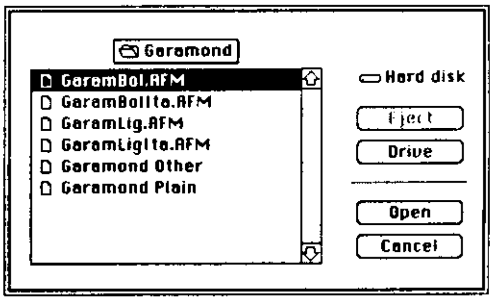
Import kerning...

Fontographer allows you to import kerning tables from either Adobe Font Metrics (AFM) files or bitmap font files. If your font does not have a specific kerning pair defined in the AFM file, Fontographer will add it to your kerning table. If your font includes this kerning pair, Fontographer will replace the old pair with the new kerning table information.

To import a kerning table from a bitmap file:

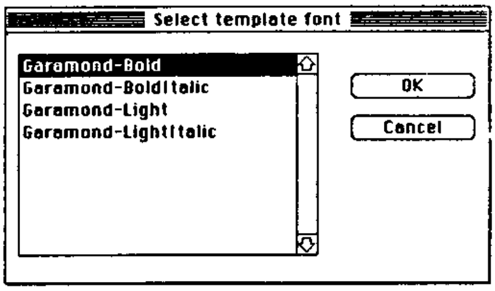
- Open the font to which you wish to apply the new kerning table.
- Choose "Import kerning. . ." from the File menu.

  This presents the standard file selection dialog, which allows you to choose a font file. The file selection dialog works in the standard fashion, so you can change drives, eject disks, open a file, or cancel.



- Select a bitmap font file.

  This presents the "Select template font" dialog.



- Choose the bitmap font which contains the kerning table information you'd like applied to your font.
- Click "OK."

To import a kerning table from an AFM file:

- Open the font to which you wish to apply the new kerning table.
- Choose "Import kerning..." from the File menu.

  This presents the standard file selection dialog, which allows you to choose an AFM or a bitmap font file. The file selection dialog works in the standard fashion, so you can change drives, eject disks, open a file, or cancel.

- Choose the AFM font file which contains the kerning table information you'd like applied to your font.
- Click "Open."

  Fontographer automatically applies the new kerning table information to your font.

Clear kerning pairs

This option allows you to remove all kerning pairs from your font. You may wish to do this before choosing "Import kerning" for a font.

To clear kerning pairs:

- Open the font from which you wish to clear the kerning pairs.
- Select "Clear kerning pairs" from the Edit menu.

  Fontographer automatically clears all kerning pairs from your font.

Chapter Nine

The Bitmap Window

The ***bitmap window*** is provided for hand-editing your bitmap fonts. Bitmap fonts are required for Macintosh screen display. Actual images can only be displayed if there is a bitmap font file accessible for the font. A 24-point bitmap representation was chosen for the character slots in Fontographer's font window.

We don't believe people want to spend a lot of time editing bitmaps. Time spent editing bitmaps, regardless of the greatness of the tools, is wasted time, so we strive to eliminate this process entirely. With the advent of Adobe Type Manager (ATM) and TrueType, most bitmaps are becoming a thing of the past anyway. So spend your time designing better outlines, and bitmaps should take care of themselves.

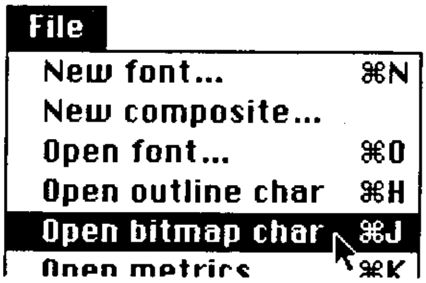
Fontographer automatically generates bitmap fonts into a font file compatible with Apple's Font/DA Mover. You have an option to apply bitmap hints automatically. Refer to Chapter 15 for more information on Automatic PostScript and bitmap hints.

You'll occasionally need to edit these automatically generated bitmap fonts before they look good on your screen. Sizes larger than 24-points can often be used directly, but occasionally your bitmap font may need some level of hand editing to achieve an aesthetically pleasing image.

Opening a bitmap window

To open a bitmap window from the font window:

- Select a character by clicking on it.
- Choose "Open bitmap char" from the File menu or type ⌘J.



OR

- Hold down the Option key and double-click on the character.

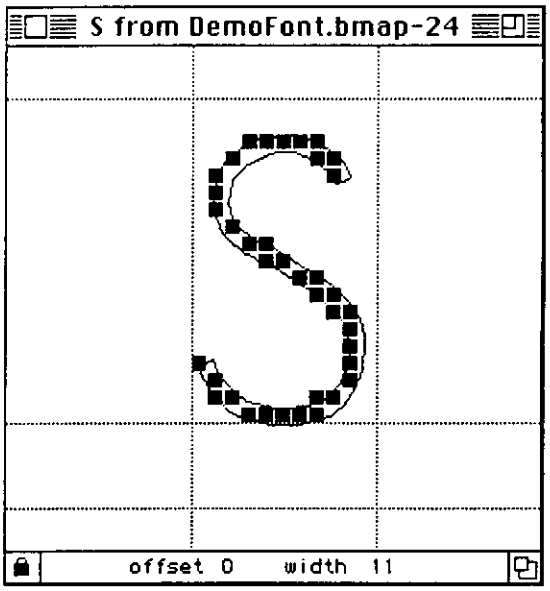
To open a bitmap window from the character window:

- Choose "Open bitmap char" from the File menu or type ⌘J.

  Multiple windows can be opened so that different characters (or even different point sizes of a single character) can be worked on at the same time. This is especially helpful when editing a character with different bitmap point sizes.

The bitmap window

The *bitmap window* has the standard title bar, zoom box, and close box. The title of a bitmap window has the character and the name of the font whose bitmap is being adjusted, followed by ".bmap" and the bitmap point size. There are no scroll bars in the bitmap window, but the grow box in the lower right hand corner allows it to be enlarged or reduced.



offset 0 width 11

The central edit area

The largest area of the bitmap window is the *central edit area*. This is where all drawing and editing takes place. A pixel (FatBits) view of the selected character appears in the central edit area. Behind the FatBit character is an image of the outline character and the guidelines plane which shows the baseline, ascent, and descent lines of the font.

Offset and width values

Directly below the central edit area is a small area which displays the ***offset and width values*** for the character. These correspond to the outline character's values. The offset value will change to correspond to any changes made to the bitmap character's offset. The width value will change ***only*** if the outline character's width changes ***and the bitmap character is regenerated.***

Changing characters in the bitmap window:

🔒

There's a small lock in the lower left corner of the bitmap window. If the lock is black (and in a locked position), it locks the current character into that window. This prevents a character from being changed in case another character key is accidentally hit.

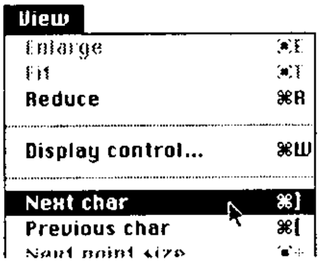
🔓

If the lock is white (and in the unlocked position), you can switch to editing a different character by typing that character's keystroke(s). You can toggle the lock on and off by clicking on it, or by hitting the Return or Enter key.

Next and previous characters

To choose the next character:

- Choose "Next char" from the View menu or type ⌘].



To choose the previous character:

- Choose "Previous char" from the View menu or type ⌘[.

Visible planes

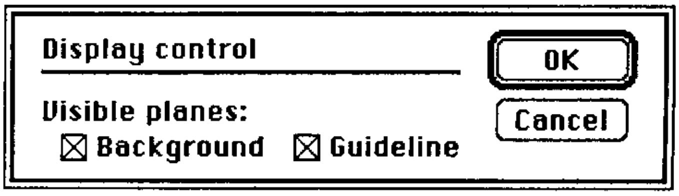
The image behind the bitmap character is the outline character. It is in the background and can be used as a guide for editing your bitmap characters. The outline character cannot be edited in the bitmap window. Any changes made in the outline character edit window will be reflected in the bitmap window's background outline.

The guidelines in the bitmap character's background are the ascent, descent, and baseline of the font. These guidelines cannot be changed in the bitmap window. It is, however, possible (and quite easy) to hide these images in the bitmap character's background.

The guidelines and background planes can be set to display or not display.

- **Choose "Display control..." from the View menu or type ⌘W.**

  The "Display control" dialog box provides the option of viewing (or hiding) the outline character's background or guidelines from the bitmap window.



Display control

Visible planes:
☒ Background ☒ Guideline

- **Choose an option and click "OK."**

  Typing Option B or Option G will also show or hide these planes.

Note: When external composite fonts are used (i.e., composites of 'Times' or 'Helvetica') outlines are not displayed in the background plane since the actual outlines are not available.

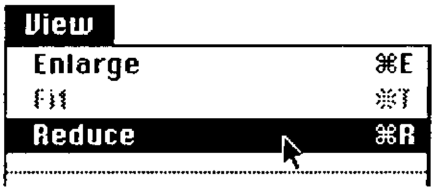
Sizing characters

The bitmap edit window allows four different levels of magnification. The "Reduce" command gives you the ability to reduce or shrink the bitmapped picture in your edit window. These various levels of magnification come in handy when editing large point sizes of bitmaps.

The bitmap window opens with the character displayed at eight times the actual character's size. The first reduction displays the character at four times the actual size. The next reduction displays the character at two times the actual size. The last (and lowest) level of reduction shows the character at its actual size. When the character is previewed in its actual size, the pen tool is inactive and the outline character in the background is automatically hidden.

Reducing a bitmap picture's magnification:

- Choose "Reduce" from the View menu or type ⌘R.



OR

- Press the Option, ⌘, and space bar at the same time, then click to *reduce* magnification.

Enlarging a bitmap picture:

- Choose "Enlarge" from the View menu or type ⌘E.

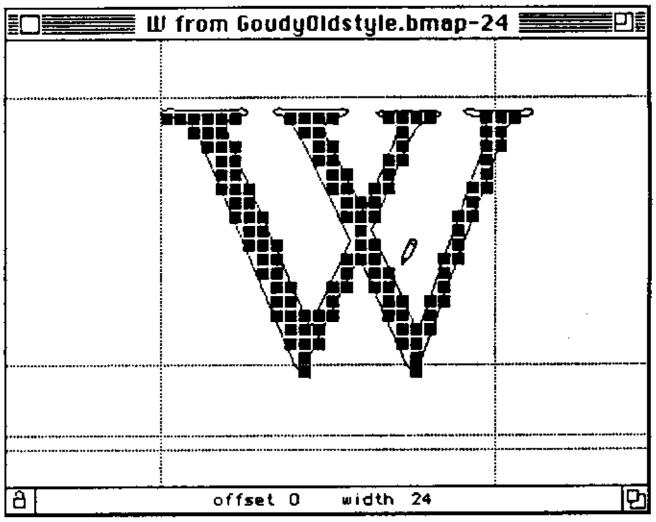
OR

- Press the ⌘ key and space bar at the same time, then click to *magnify* the bitmap character.

Tools in the bitmap window

There is no visible toolbox in the bitmap window. However, certain keys and key combinations provide all the tools that are necessary to edit bitmaps.

The bitmap window has a standard ***pencil tool*** like most paint programs (i.e., MacPaint).

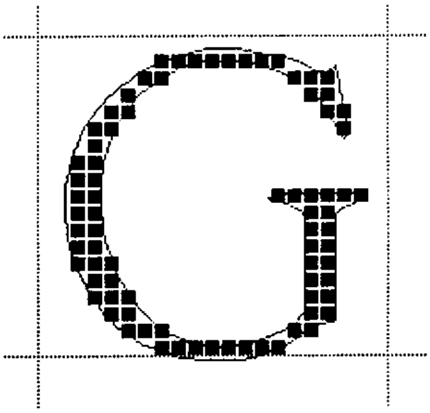


When you place the pencil above the fatbit and click, the bit will change from black to white or vice versa. You can either drag or click with the pencil. Clicking draws just one dot. Dragging produces a line of dots. Holding the Shift key down while dragging constrains drawing to a vertical or horizontal straight line.

The **pencil tool** can be changed to a ***hand tool*** by pressing the space bar. The hand tool scrolls the entire character window. Move the bitmap image around to a comfortable position before you begin to edit it. You'll need to do this if your characters are too large to fit into the edit window.

Editing a bitmap character

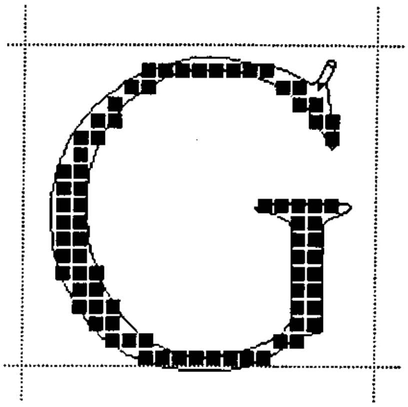
A bitmap character can be fine-tuned to more accurately match the outline character or to eliminate extra dots for smaller font sizes. For instance, this character "G" has an excellent automatically generated bitmap. However, you can still change it slightly to suit your individual preference.



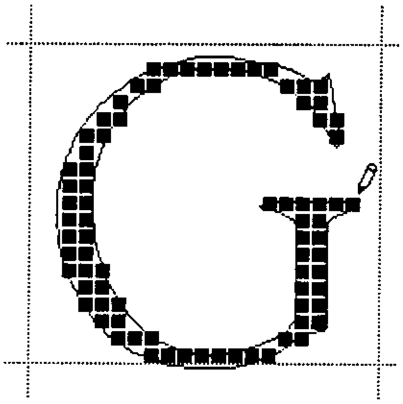
Remember that you cannot change the position of the background lines because they are determined by the outline font definition.

Now we'll simply click on each dot that we want to remove and then click again to place dots where we think they would look better.

- Click on the dots to be removed; they will disappear.



- Now click on a blank space; a dot appears.



As you can see, drawing in bitmaps is really very easy!

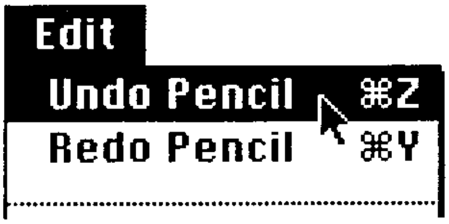
Undo and Redo

If you misplace a dot, there are two ways to correct it.

- Click on the dot to remove it.

OR

- Choose "Undo Pencil" from the Edit menu.



"Undo Pencil" will undo your changes up to eight changes back.

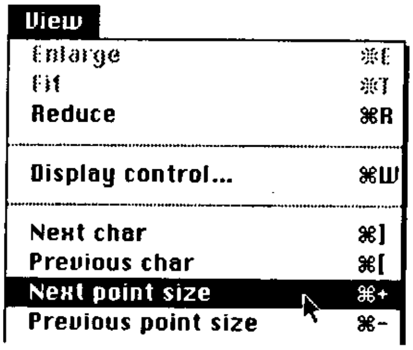
"Redo Pencil" will replace the "Undone" dots up to eight Undos.

Changing and editing different point sizes

If you have an existing font with more than one point size, it is possible to edit these fonts without opening each size individually.

To change to a larger font size:

- Choose "Next point size" from the View menu or type ⌘+.



The next larger point size of that character will automatically replace the character in the window.

To change to a smaller font size:

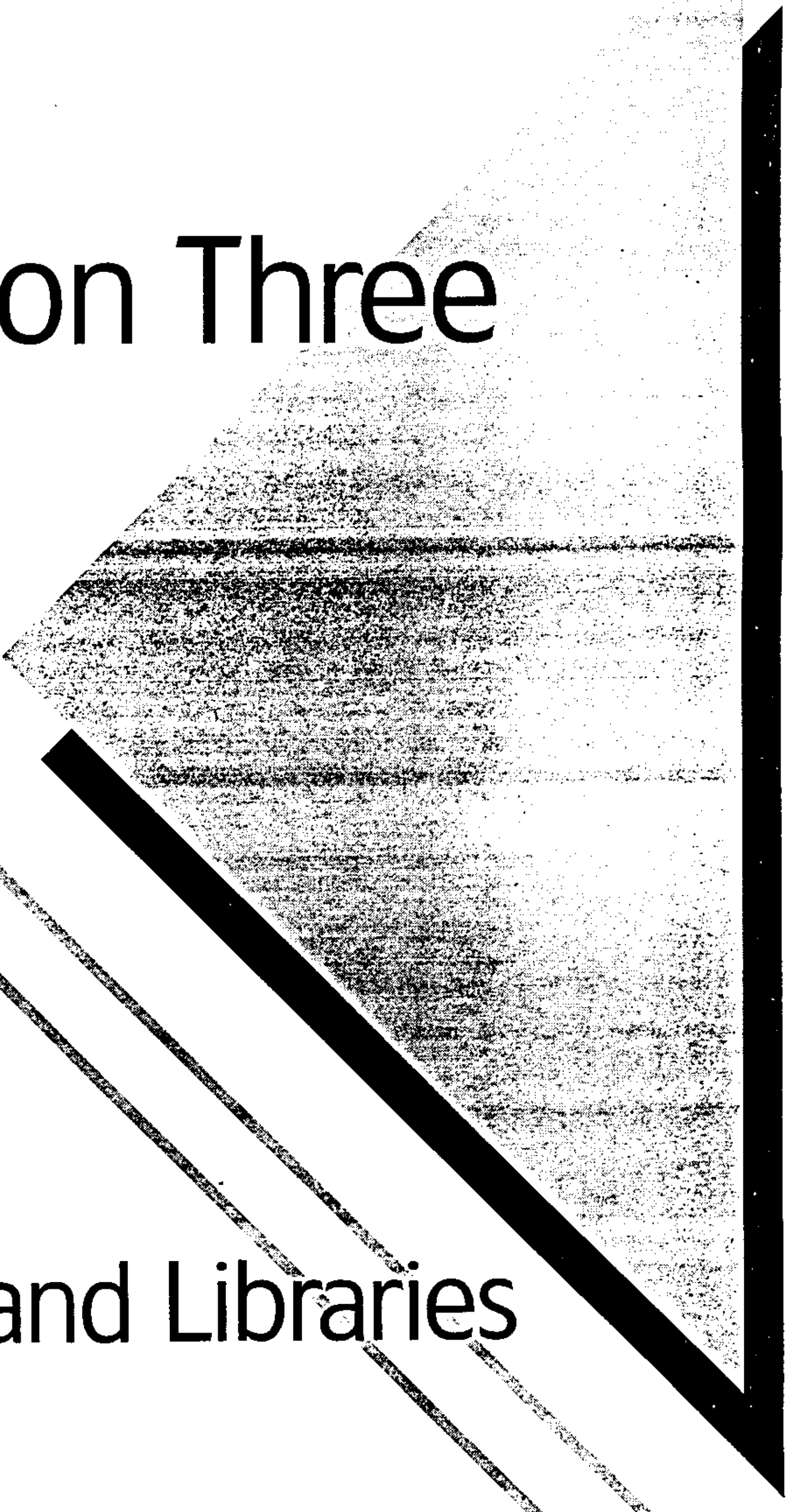
- Choose "Previous point size" from the View menu or type ⌘-.

  The next available smaller point size of that character will automatically replace the character in the bitmap window.

  All characters will remain in the new point size until the view menu is reselected.

Note: These two menu items are highlighted only if larger or smaller sizes are available.

Section Three



Composites and Libraries

Chapter Ten

Composite Fonts

A *composite font* is a reference to an existing PostScript font. Fontographer refers to the original PostScript font when it creates a composite font. When trying to print using a composite font, the definition of the existing font must be in the printer, since a composite font refers to it. Basically, a composite font is an exact duplicate of the original font, that includes any changes you may have made.

Note: If the printer is unable to locate the original font for your composite, it substitutes "Courier."

For example: When a composite of Times is made, the font "Times" is built into the printer. But if it's a composite like GoudyOldStyle, which is not a standard font in the printer, "Goudy" must be downloaded to the printer or be on the attached hard disk (if any) in the printer before you can print your composite.

Why are composite fonts useful?

Fontographer allows you to open your Type 1 fonts directly, so 90% of the time you won't have a need for a composite font. However, composite fonts can be very helpful when you wish to add some special symbols, accented characters ligatures, logos or customization to an existing font. Or you might want to add a few characters to an exisiting font and still keep the font file size small.

If there is a font resident in your printer for which you can't recover the outline file, a composite font would be the solution.

If there is a Type 3 font that Fontographer can't open, you could create a composite of that font.

If you don't have the original Type 1 font, Fontographer's composite character option allows you to easily modify existing PostScript typefaces without having to recreate the entire font.

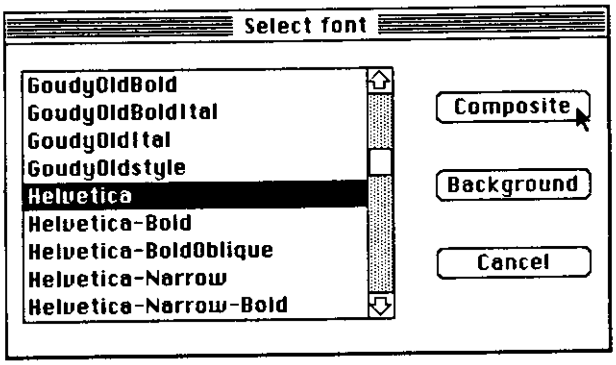
Note: When making composite fonts, the exact outlines of the characters are not shown because these outlines are in the proprietary formats of different vendors. In Fontographer, you can see the bitmap representation of each characters.

How to create a composite font

To create a composite font:

- Choose "New composite..." from the File menu.

  A dialog box appears which lists all of the fonts you have installed in your system.



- Click the "Composite" button.

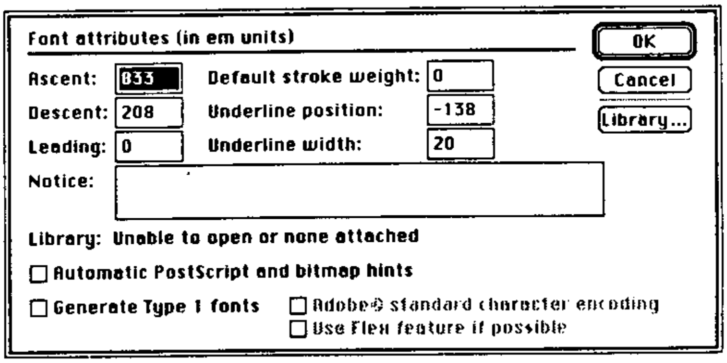
Any fonts in a family may be selected, so you can make composites of styled fonts like Helvetica-Bold and Garamond-Light. If the bitmaps of a particular style do not exist, then Fontographer uses the plain style bitmap for displaying its composites.

The "Select font" dialog has three buttons: Composite, Background, and Cancel.

If you are making a composite of a PostScript font, such as Courier or Helvetica (like we are here), choose the "Composite" button.

Choose the "Background" button if you want to trace the bitmap of a font. Choosing "Background" automatically pastes the largest size of the bitmap characters into the background plane. You may then use these characters as templates for tracing. Large point sizes of bitmaps (96-points and up) provide the best character images for tracing when brought in using the "Background" button.

A standard "Font attributes" dialog appears just like when we create a new font.



Font attributes (in em units)

Ascent: 833

Descent: 208

Leading: 0

Default stroke weight: 0

Underline position: -138

Underline width: 20

Notice:

Library: Unable to open or none attached

☐ Automatic PostScript and bitmap hints

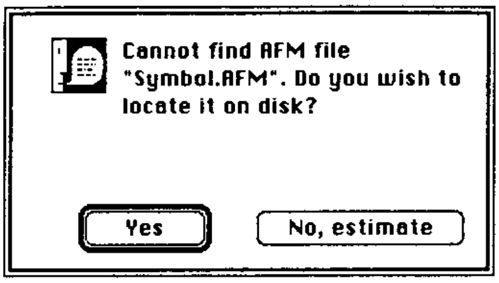
☐ Generate Type 1 fonts

☐ Adobe® standard character encoding

☐ Use Flex feature if possible

Normally you should not change anything in the "Font attributes" dialog. The only item you might want to change is the "Notice" field, in which you might put the name of the font this composite is based upon and perhaps your name and date for future reference.

Fontographer may show you this dialog:

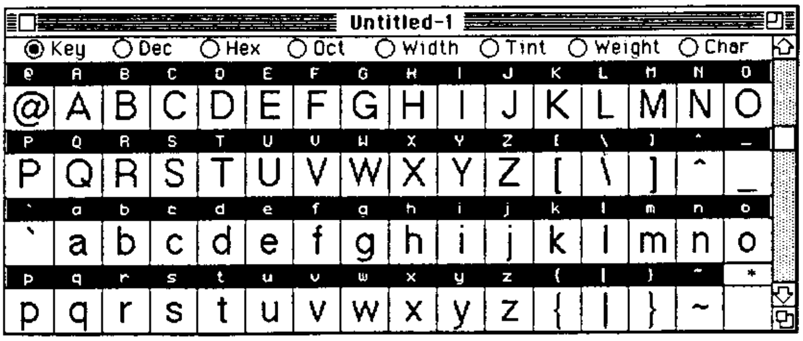


Cannot find AFM file "Symbol.AFM". Do you wish to locate it on disk?

Fontographer automatically looks for any AFM files you might have (in this example, it will look for Symbol.AFM and Helvetica.AFM). Remember that the AFM file contains the width and kerning pair information for your fonts. If you don't have an AFM file or you can't find it on your disk, click "No, estimate." Fontographer will get the widths and other information from the font tables.

Now Fontographer automatically generates the bitmap file. Fontographer shows you a progress box while it generates the required 24-point bitmap font for the font window display. It will only take a few moments for Fontographer to build a reference to the font.

Then you'll see the font window:



Untitled-1

● Key ○ Dec ○ Hex ○ Oct ○ Width ○ Tint ○ Weight ○ Char

@ A B C D E F G H I J K L M N O

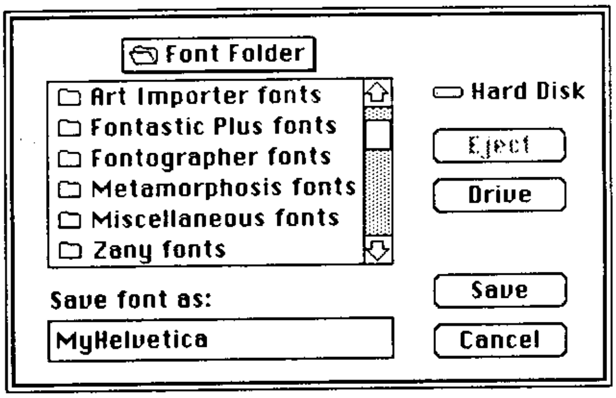
P Q R S T U V W X Y Z [\ ] ^ _

` a b c d e f g h i j k l m n o

p q r s t u v w x y z { | } ~

We now have a complete composite font which is an exact duplicate of Helvetica, complete with the bitmap representation, in our character slots.

Save the font with the name "MyHelvetica." You may need a special corporate font, in which case you might name this "CorpHelvetica." The name is completely up to you; just make sure you follow Fontographer's naming rules.



Save font as: MyHelvetica

Now you are ready to apply changes and modifications to the font.

Something we have found a need for is common fractional characters. Wouldn't it be nice to never again have to type three separate characters to get fractions like 1/2, 1/4, 3/8—and always have them look correct when they print? Fontographer allows you to create fractions like these, or anything else you like in your composite font.

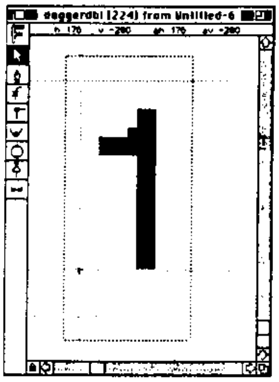
In this example, we will create the fraction ½.

We are going to create this character in one of our less used character slots.

- **First, we'll remove the character from the Shift-Option-7 key's outline window by the standard "Select" and "Clear" method.**

- **Now type "1" to select its character slot and then choose "Get part" from the Edit menu.**

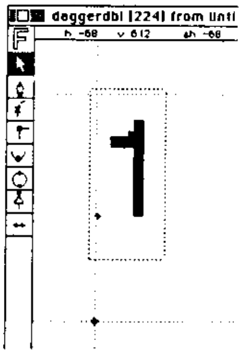
- **Go back to the Shift-Option-7 key's outline window and "Paste."**



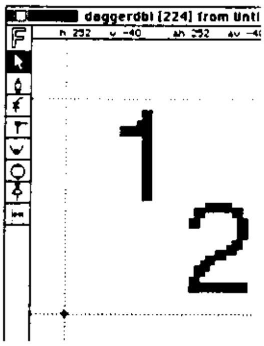
A bitmap representation of the Helvetica "1" is now in the character slot. Your character may differ somewhat from the one in the picture here. Don't worry about this. Remember, this is only a stand-in representation of the actual character. Consequently, there is no outline here. The only thing Fontographer takes from the original font display is a bitmap representation of the character.

- Now we'll choose "Scale" from the Special menu and scale the "1" by 50%.

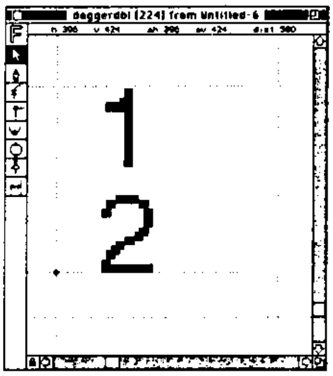
You can also scale with the alternate method of selecting the corner of the bounding box and dragging to reduce or enlarge.



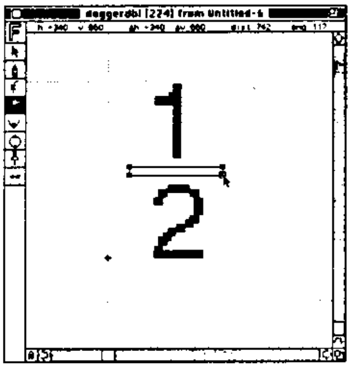
We'll repeat the above steps to place the "2" into the character slot. Adjust the two numbers until they suit your individual taste.



Perhaps you'd like your fraction to look like a standard fraction. In which case, your character's slot would look like this:



Now, all that is left for us to do is add a dividing line.



Using Fontographer's tool palette, we can draw anything in this character edit window that we would in a standard character edit window, because *they are the same*. Just because this is a composite font doesn't mean that you can't perform any of the other functions you would in a new or existing font.

It seems logical then that you can also change the character's fill and stroke, or rotate and skew it, etc. You can type ⌘K to open the metrics window and get a preview of what your composite character will look like.

You can also print a sample, which we hope you'll do now to see your new fraction. Here is a 24-point PostScript example of the fraction we just created:

$$\frac{1}{2}$$

We have just created our own modified version of Helvetica. You can continue making any other changes you'd like.

Using and generating your composite font

Now that you've seen a printed sample of your composite font, it's time to generate a Macintosh PostScript font that you can use in any Macintosh program. Use the same options you learned in Chapter Four, "Generating Fonts," to generate your composite font.

Note: If you are building a composite of some font that is not built into your printer (GoudyOldstyle, for instance) you must use the LaserWriter Font Utility (on Fontographer's "Tools & Utilities" disk) to download the original font's PostScript into your printer before you can print samples.

Now you can continue to create fractions, special symbols, and accent characters. Our next chapter, "Composite characters," shows you in detail how to create your own logos and much more.

Chapter Eleven

Composite Characters

Composite characters are those which reference other characters in a font, unlike composite fonts which reference other fonts. Composite characters can save you memory space and time because they are *references* rather than actual drawings. Because a composite character merely references a drawing rather than duplicating it, all the instructions required for creating that shape in the printer need only appear once, thus saving memory in the printer.

When are composite characters useful?

You should use composites if you are creating very complex characters consisting of many repeating parts.

If you decide to make a change in some character part that you have distributed to many composite characters in your font, you only need to change the original character; all composite characters that reference that part will be updated automatically.

Composite characters are the only way to bring together several layers of images so that they will juxtapose properly. You can, for instance, draw a white character on a black background using composite characters.

There are four basic steps to creating a composite character:

- Select a character from the font or edit window.
- Choose "Get part" from the Edit menu.
- Select the target character slot.

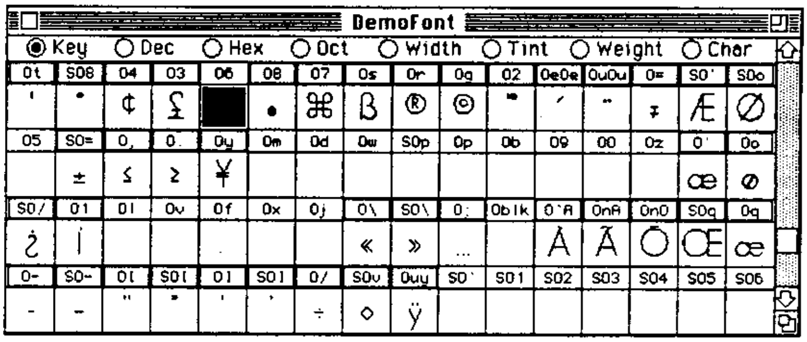
- Choose "Paste" from the Edit menu.

The composite character reference displays in the edit window as a bounding box around an outline without points. You cannot modify the outline in the composite: it must be modified in the original character.

To create a composite character:

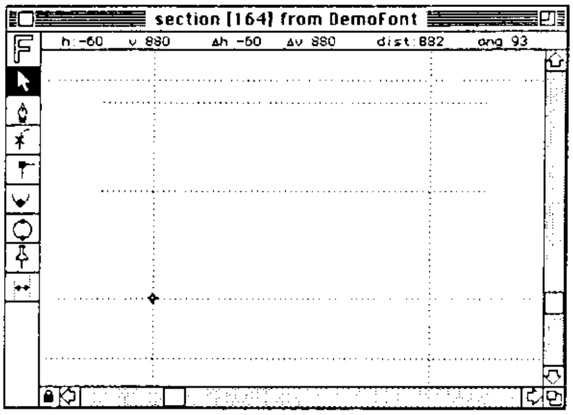
- Open a copy of the DemoFont (you can find it on Fontographer's "Tools & Utilities" disk).

- Hold down the Option key and type "6." The empty slot between the "£" and the "•" will highlight.

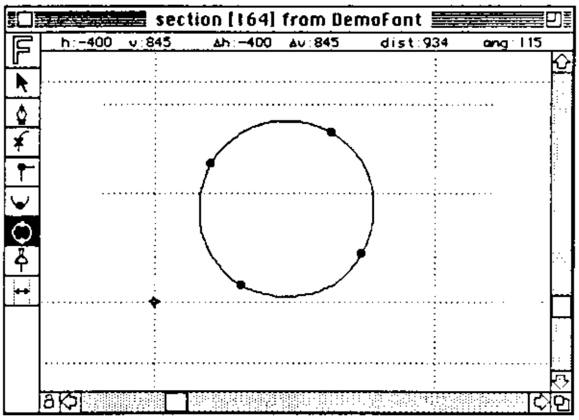

DemoFont
● Key ○ Dec ○ Hex ○ Oct ○ Width ○ Tint ○ Weight ○ Char

- Double-click on the character to open its outline edit window.

The window displays an empty drawing area.


section [164] from DemoFont
h: -60 v 880 Δh -60 Δv 880 dist: 882 ang 93

- Draw a circle with the circle tool.

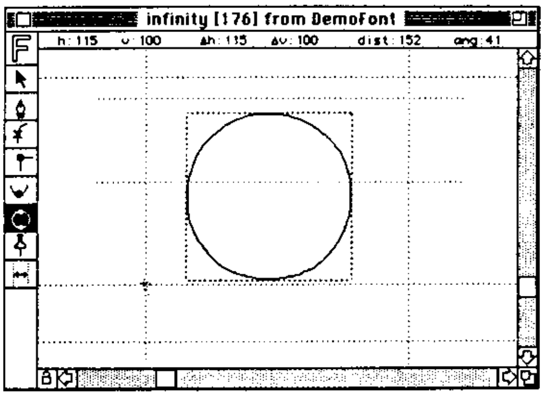

section [164] from DemoFont
h: -400 v: 845 Δh: -400 Δv: 845 dist: 934 ang: 115

- Choose "Get part" (⌘G) from the Edit menu. This will create a reference to this filled circle.

- If your character edit window is locked, click on the lock icon in the lower left hand corner of the window (or press the Return key) to unlock it.

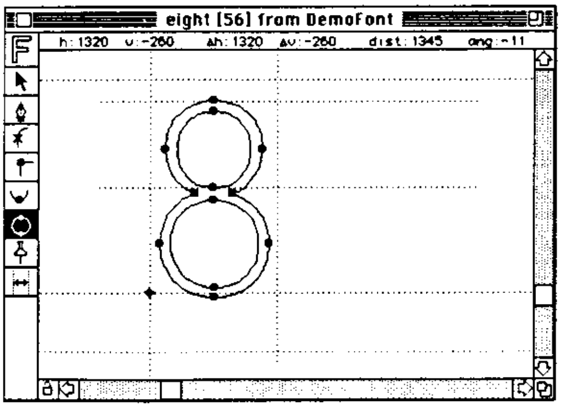
- **Hold down the Option key and type "5."**
- **Choose "Paste" from the Edit menu.**

  This pastes the character, with the circle you just drew, into the slot.

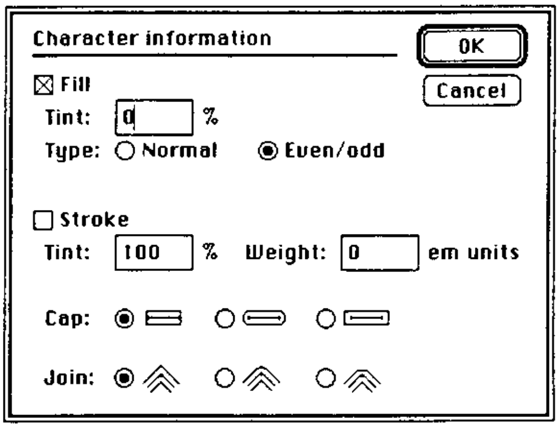

infinity [176] from DemoFont
h: 115 v: 100 ah: 115 av: 100 dist: 152 ang: 41

We have only made a reference to this character, consequently only its outline is visible within the bounding box. However, all transformations from the Special menu can be applied to this part.

- **Type "8."**



- Choose "Char info. . ." from the Edit menu and change the fill percent to white by typing the number zero in the "Tint" box.



Character information

☒ Fill
Tint: 0 %
Type: ○ Normal ● Even/odd

☐ Stroke
Tint: 100 % Weight: 0 em units

Cap: ● ○ ○

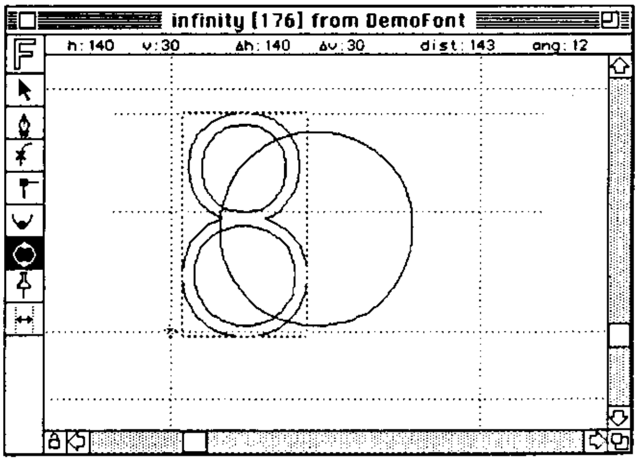
Join: ● ○ ○

- Click "OK."

- Choose "Get part" from the Edit menu.

- Type Option "5."

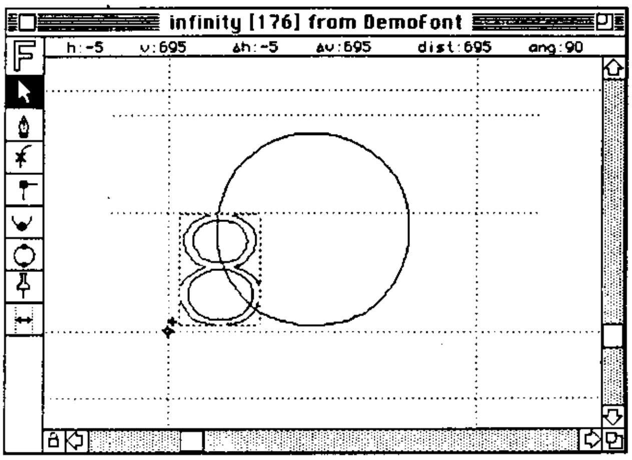
- "Paste" the reference to the "8" into the composite character.



infinity [176] from DemoFont

h: 140 v:30 Δh: 140 Δv: 30 dist: 143 ang: 12

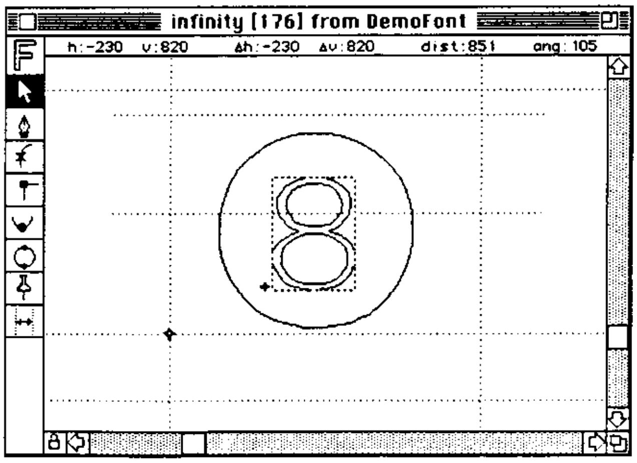
- Drag the top right hand corner of the bounding box for the "8" down and to the left until the "8" appears small enough to fit in the circle.



OR

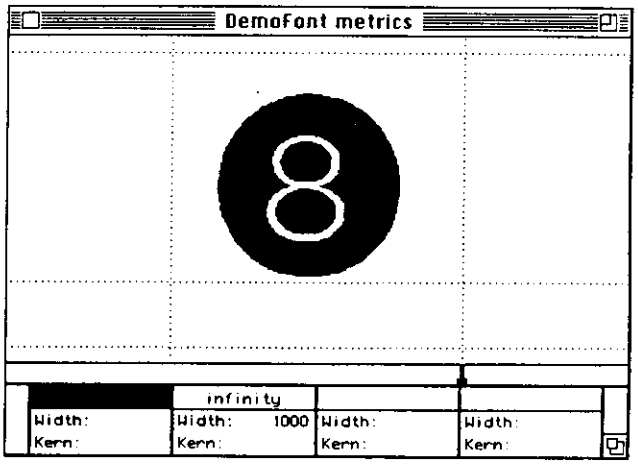
- Choose "Scale" from the Special menu and enter the percentage you'd like the "8" to scale in the "Uniform scaling" box.

- Move the bounding box of the "8" so that it appears within the circle.



- Choose "Bring to front" (⌘F) from the Path menu to make sure that the "8" will appear in front of the black background.

- Choose "Open metrics. . ." (⌘K) from the File menu to preview your new composite character.



	infinity		
Width:	Width: 1000	Width:	Width:
Kern:	Kern:	Kern:	Kern:

- Select the outline edit window again and choose "Print. . ." from the File menu to print a sample of your new character.

Congratulations! With a minimal amount of effort, you've just created your first composite character. Without really creating another "8," we used an existing character, referenced it, and then made alterations to the reference character. You can "Save" this character back into the copy of "DemoFont" if you wish.

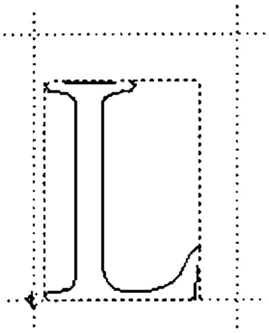
Decompose composite

Choosing the "Decompose composite" command breaks an internal composite into explicit paths. This is useful when building characters like the Lslash.

Note: This command only applies to characters in the character edit window.

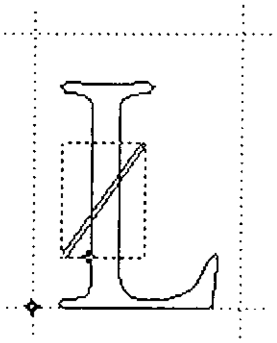
To decompose a composite character:

- Select the "L" and choose "Get part" from the Edit menu.
- "Paste" the character into a slot.

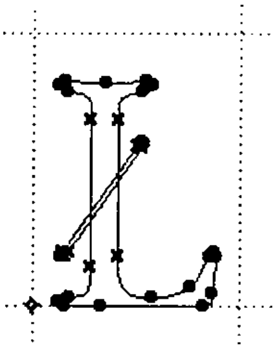


- Select the "/" and choose "Get part" from the Edit menu.
- "Paste" the character into the "L" slot.

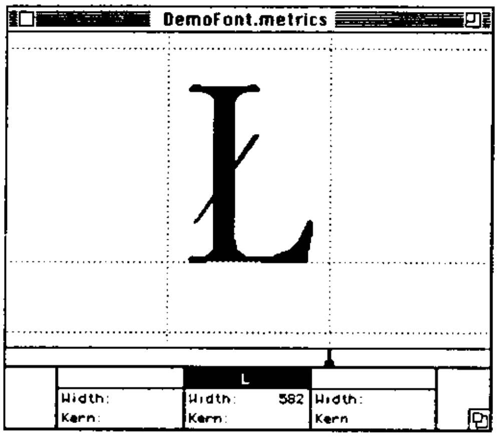
- Scale and move the parts as necessary.



- Choose "Decompose composite" from the Special menu.



We used the "Remove overlap" command in the Special menu to get the final character you see in the metrics window below.



Width:
Kern:
Width: 582
Kern:
Width:
Kern:

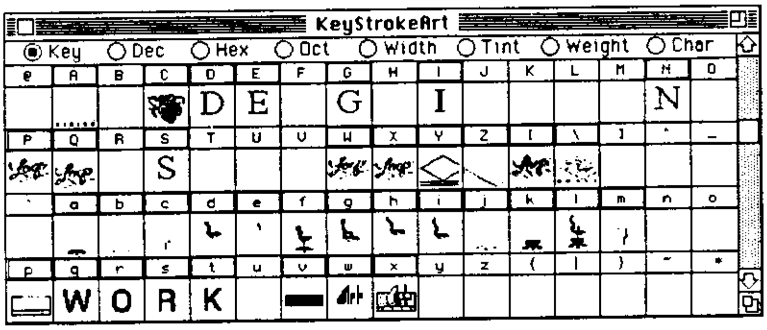
Using library file composites

One of the most powerful uses for composite characters is to use them in conjuction with a library file. Any Fontographer outline source file can be attached to a font as a library (see the "Font attributes" dialog). Its contents can then be used as composites in your font. Chapter 12 covers "Libraries" in detail.

Creating logos with composites

Another powerful use for composite characters is to design logos and other artwork consisting of several parts brought together into one character. "KeyStrokeArt" is a font that illustrates how this is done. You'll find "KeyStrokeArt" on Fontographer's "Tools & Utilities" disk.

- Copy "KeyStrokeArt" off the master disk and open it by double-clicking on its icon.

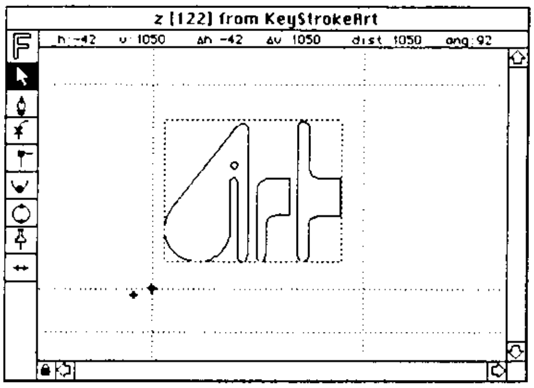


- Click on the "w" and choose "Get part" from the Edit menu or type ⌘G.

- Click on the "z" slot and "Paste."

- Double-click on the character "z" to open its character edit window.

This is what you'll see:


z [122] from KeyStrokeArt
h: -42 v: 1050 Δh -42 Δv 1050 dist 1050 ang: 92

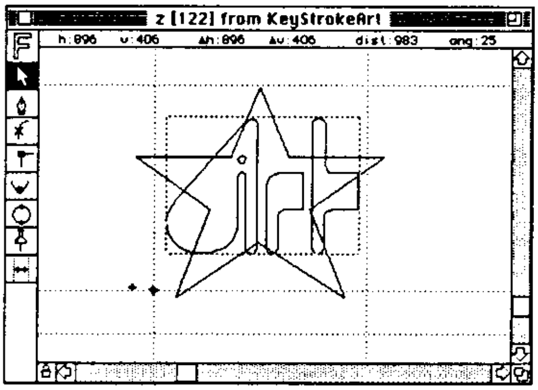
Now we will go to the "OuA" character.

- Hold down the Option key and type "u" and then "A."

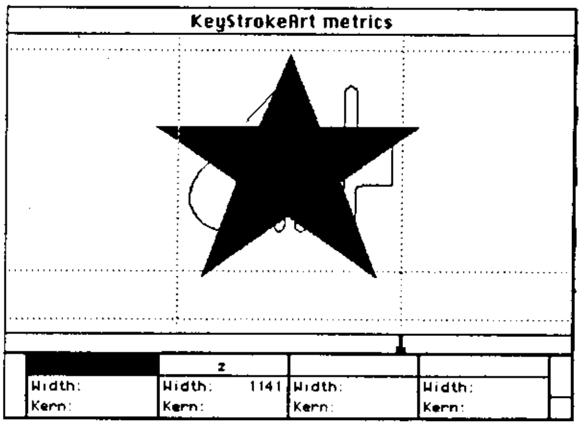
- Type ⌘G to "Get part."

- Now we'll go back to the character "z" and "Paste."

  This is what your edit window will look like after you have pasted:

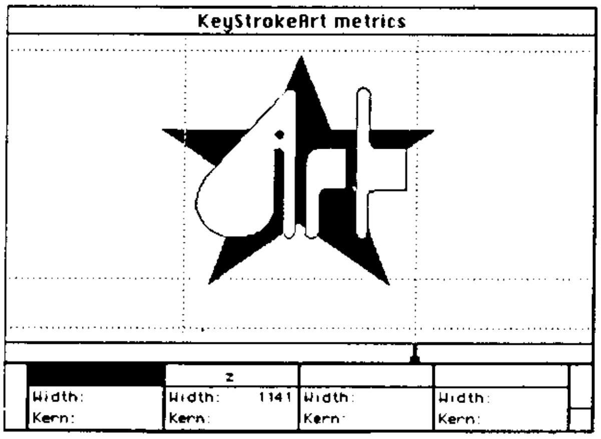

z [122] from KeyStrokeArt
h: 896 v: 406 Δh: 896 Δv: 406 dist: 983 ang: 25

Now we will preview the composite character by opening the metrics window.



Oops! As you see, the layering is not as we'd like. We need to move "Art" to the front, or the "Star" to the back. We can do this very easily by using the "Bring to Front" or "Send to back" command.

- Click on the "Star" in the *character edit window* to select it, and type ⌘B to send it to the back.

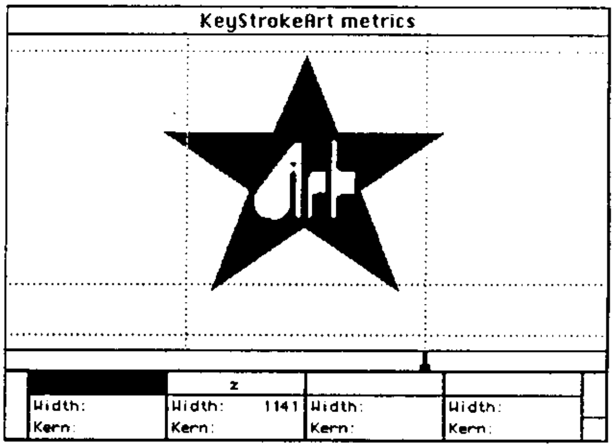


Now we are going to reduce the "Art" and finish our logo.

- **Switch back to the outline edit window.**

- **Click on the upper right corner of the "Art" bounding box and drag to reduce.**

- **Drag and position the "Art" until your metrics window looks like this:**



KeyStrokeArt metrics

	z		
Width: Kern:	Width: 1141 Kern:	Width: Kern:	Width: Kern:

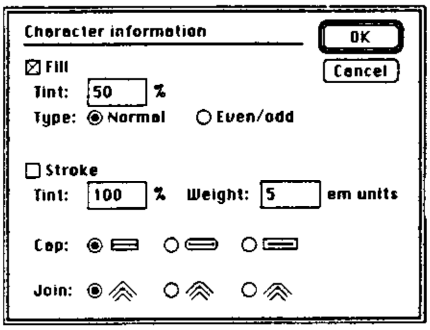
Note: Your metrics window can be left on the screen during this move, in order to see how Fontographer interactively updates the composite character.

We can also interactively change the background fill in the characters without touching the composite character.

- **Click on the original character "OuA" in the font window.**

- **Choose "Char info..." from the Edit menu.**

When the "Character information" dialog box appears, enter a tint of 50%.



Character information

☒ Fill
Tint: 50 %
Type: ● Normal ○ Even/odd

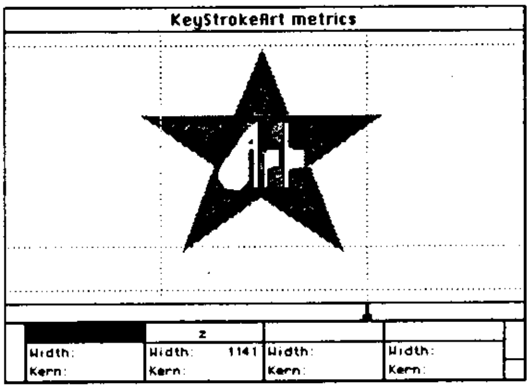
☐ Stroke
Tint: 100 % Weight: 5 em units

Cap: ● ○ ○

Join: ● ○ ○

Your composite character's metrics window interactively changes to reflect the changes you made to the original character.

Your metrics window now looks like this:

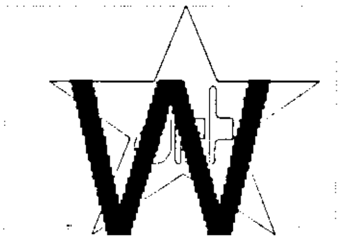


KeyStrokeArt metrics

	z		
Width: Kern:	Width: 1141 Kern:	Width: Kern:	Width: Kern:

Wow! You probably think that's great (well, so do we). But are we going to stop here? No... we will continue improving this composite character.

- Click on the "q" to select it and then type ⌘G to "Get part."
- Then "Paste" the "W" into the "z."



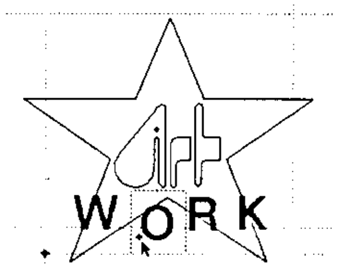
As you can probably ascertain, the "W" is way too large for what we have in mind, so we'll select "Scale..." from the Special menu.

- **Type 20% into the "Uniform scaling" dialog box.**

- **Repeat for the "r," "s," and "t," which will paste the reference characters "O," "R," and "K" into our composite character along with the "W."**

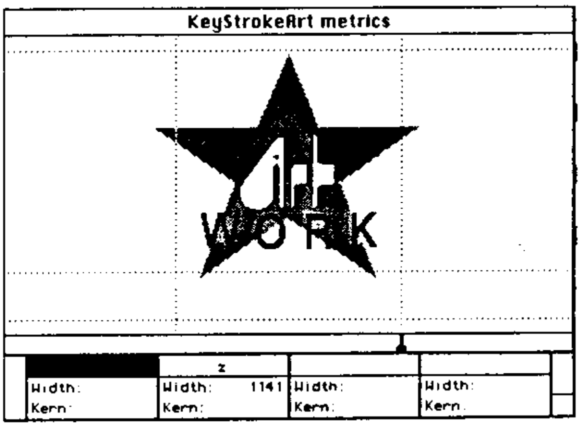
The characters "W," "O," "R," and "K" are actually composites of Helvetica. First we created a composite font of Helvetica, which we named "MyHelvetica." Then we copied these characters from MyHelvetica and pasted them into these slots. This way, we could use these Helvetica characters without having to redraw them.

Now we can draw a guideline in the guidelines plane and line up our reference characters by dragging them. This is made easy by the fact that the basepoint is visible; line it up with the guideline.



Note: The plus (+) sign indicates the position of the part with reference to its origin in the actual character.

Our final metrics window will look like this:



Width: 1141

We've given you some ideas to start with. Now see what interesting combinations you can create with the fonts you have already created, your own existing artwork, and the "KeyStrokeArt" font we've provided on Fontographer's "Tool's and Utilities" disk.

11

Special characters

Another typical use of composite characters is to create special (i.e., dipthongs, ligatures, and diacritical) characters.

Some of the most common diacritical (accent) characters are: á, ä, â, é, and ö. We'll create a special accent character font and we'll create the "ä" as its first composite character.

- Double-click on "DemoFont" to open it.

- Click on the "a" to select it.

- **Choose "Copy" from the Edit menu.**

- **Click on the "KeyStroke Art" font window, and then type "1."**

  Choose another slot if that slot is already taken.

This will take you to the slot labled "one (49)."

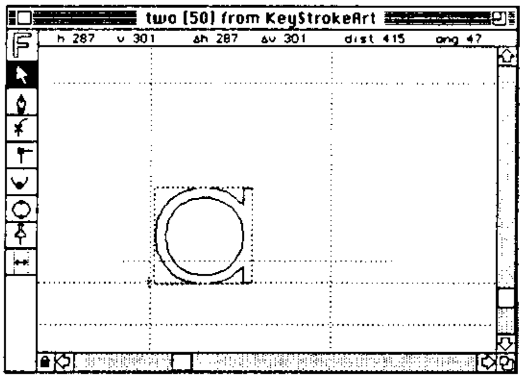
- **Choose "Paste" from the Edit menu.**

- **Choose "Get part" from the Edit menu.**

- **Either type or click on "2" and "Paste."**

  Now we have a reference character "a" in the "2" slot.

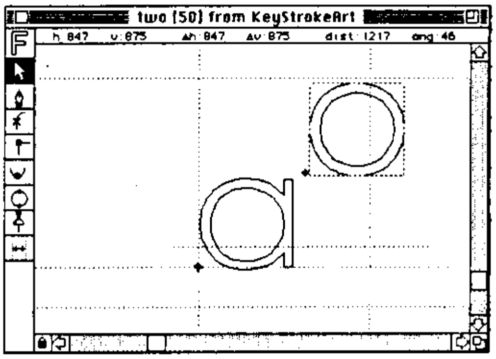
It is not necessary to open the character window for this slot, but let's do it now so you can see the results of the paste command.



You can see the outline of the "a" within the bounding box.

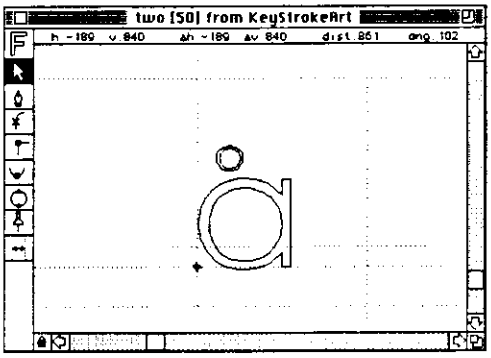
Now you have two options: draw two concentric rings on top of the "a" with the circle tool or use the existing letter "o" as a ring. You may copy the existing "o" from our "DemoFont" and paste it into any empty character slot in "KeyStrokeArt."

Then we will perform a "Get part" on that character and paste it into the "2" where our referenced "a" already resides.

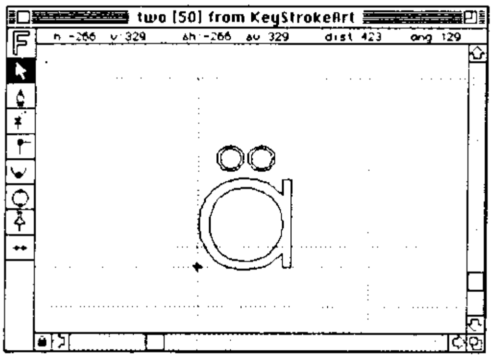


Now we'll choose "Scale" from the Special menu and perform a "Uniform scaling" of 20% or grab one of the corners of its bounding box, and press and hold the Shift key while we drag the corner until it is small enough to use for the ring.

Position the new part above the "a" by selecting inside its bounding box and dragging it to the desired location. If more scaling is desired, you can do so.



Now, all we have to do is select the reduced reference "o," duplicate it (⌘D), and position it to the right of the other "o."


two [50] from KeyStrokeArt
h -266 v 329 Δh -266 Δv 329 dist 423 ang 129

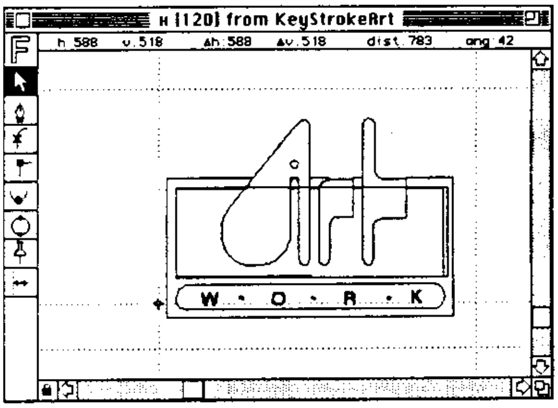
It's that simple. There are many more special characters to create and Fontographer provides the perfect vehicle for this task. Only now, it won't be as much of a task.

The next section shows you how we created some other characters in "KeyStrokeArt." We don't want you to perform the steps we list here... we only want to show you how we created these characters. We know that you'll have lots of fun combining the things you've already learned in earlier chapters with the ideas we present here.

First let's look at the parts that make up the "Art Work" logo in the character "x."

- **Double-click on the character slot "x" to open it.**

You'll see this:



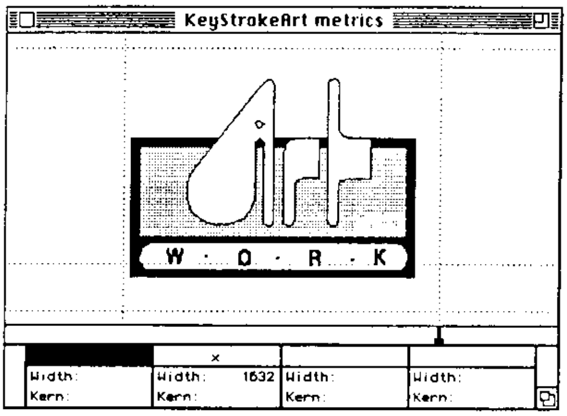
x [120] from KeyStrokeArt
h 588 v 518 Δh 588 Δv 518 dist 783 ang 42
W • O • R • K

- **If you select the "W" in this composite character, you'll see that it's a separate object.**

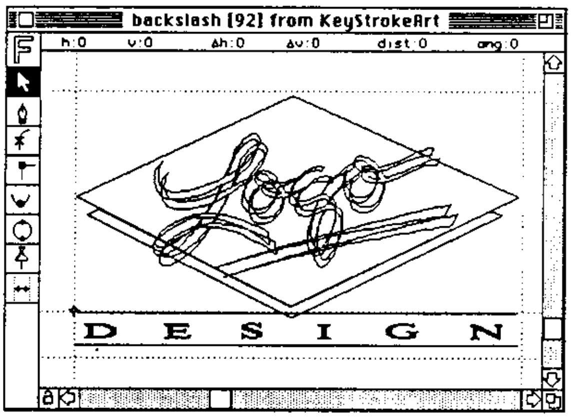
You know (from our previous section above) how it got to be this way.

All the other items in "Art Work" were brought in with the "Get part" method and then positioned so that they lined up as intended. Notice the slight overlap of some of the parts.

- With the "x" still selected, open the metrics window (⌘K). Fontographer shows you what the Art Work character will look like when printed out.



Next let's look at the "Logo DESIGN" composite character which is assembled in the backslash ("\") character of "KeyStrokeArt."

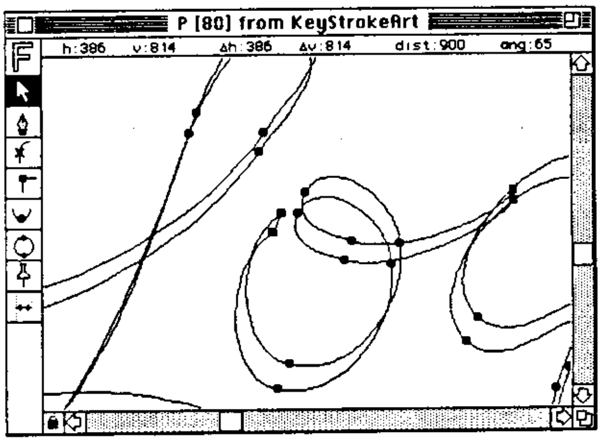


The letters in "DESIGN" were pasted in via the "Get part" command from their corresponding uppercase letters in "KeyStrokeArt."

- Open the letter "D" and you'll see the original Times-Roman "D."

We brought these Times-Roman letters into "KeyStrokeArt" the same way we brought the Helvetica letters into the Art Work design. Then we scaled them.

- **Double-click on the letter "P." Hold down the ⌘ and Space keys and click twice inside the shape of the letter "o" to magnify the drawing area.**



The assembled design (in the "\") has a drop-shadowed effect. Here's how we did it:

You'll see a representation of the artwork in "W," with only minor changes to accomodate the different appearance of a part that is only a 20% black shadow. You'll notice that some of the line widths are thicker to make the shadow look more realistic.

The letter "Y" contains some more original artwork intended to serve as a pleasing frame for the rest of the design: Notice that this character is not filled. Instead it is stroked with a stroke width of 5 em-units. The letter "Z" holds another framing device.

Finally, the "[" holds the two logo designs in proper registration with one another.

Creating internal composite characters from a Type 1 font

When creating internal composite characters, it is worthwhile to do so in a way that gets the maximum compression in your Type 1 font.

- Select the character from either the font or edit window of the Type 1 font.
- Choose "Get part" from the Edit menu.
- Select the target character slot.
- Choose "Paste" from the Edit menu.

  You should not move or transform the character in any way.

If you are going to add an accent to your character:

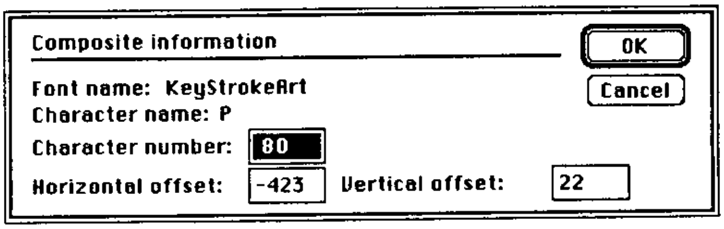
- Select your accent character and then choose "Get part."
- "Paste" the accent character and move it into the correct position.

  Do not transform the character in any other way.

If you follow this procedure, Fontographer will generate a font with the optimal Type 1 code.

Location...

If you select a composite part, you can get information regarding its reference and location by choosing "Location..." from the Point menu. For instance, if you select the part that says DESIGN in the character "\" you'll see this dialog:



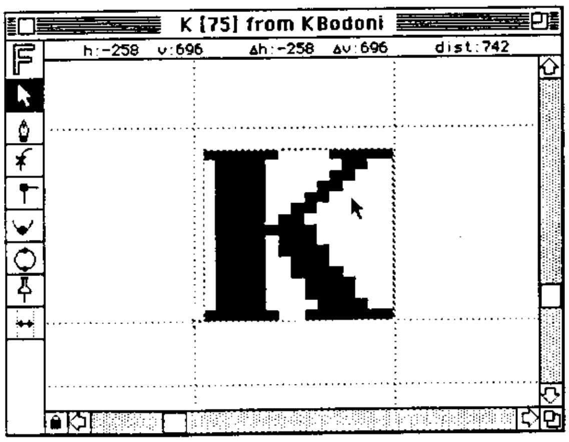
Composite information

Font name: KeyStrokeArt
Character name: P
Character number: 80
Horizontal offset: -423 Vertical offset: 22

Changing location and reference

The "Character number" can be changed so that it points to a different character in the currently open composite.

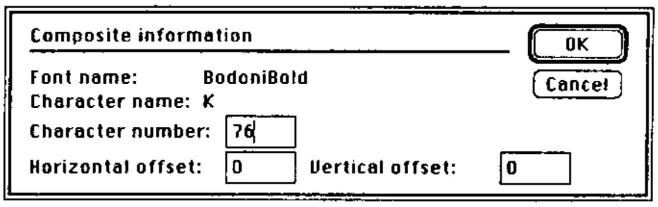
- Open a character edit window.
- Select the composite character.



- Choose "Location..." (or type ⌘L) from the Point menu.

Fontographer's "Composite information" dialog appears.

- Type in the "Character number" you'd like this character slot to reference.



Composite information

Font name: BodoniBold

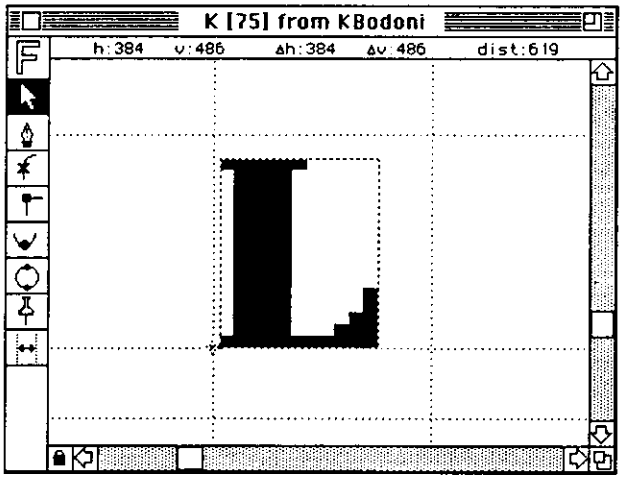
Character name: K

Character number: 76

Horizontal offset: 0

Vertical offset: 0

Character number "75" now references character number "76."



You can also change the numbers in the "Horizontal offset" and/or "Vertical offset" items to move the part.

Commands for manipulating composite characters

Layering commands

These layering commands work only with composite characters. You must create the character from parts brought into it with the Edit menu's "Get part" item.

Bring to front

When some part of your composite character is being obscured by some other part in front of it, you can select the obscured part and choose "Bring to front" from the Path menu to bring it in front of all other parts in the character.

Send to back

When you want some part of your composite character to be covered up by other parts, you can select the part to be obscured, then choose "Send to back" from the Path menu. The part will be sent behind all other parts in the character.

Bring forward

If you want to bring some part of your composite character forward one layer, select the part and use "Bring forward" from the Path menu. The part will move up one layer in your composite.

Send backward

If you want to send a part of your composite character back one layer, select the part and use "Send backward" from the Path menu. The part will move back one layer in your composite.

Transformation commands

Scaling

You can scale any composite part by selecting it and choosing "Scale..." from the Special menu. Or you can scale a part visually by dragging any of its corners.

Rotating

You can rotate any composite part by selecting it and choosing "Rotate..." from the Special menu. Enter the number of degrees of rotation you wish to impose on the part: positive numbers will rotate the part counterclockwise, while negative numbers will rotate it clockwise.

Skewing

You can skew any composite part by selecting it and choosing "Skew..." from the Special menu. Enter the number of degrees of skew you wish to impose on the part: positive numbers will skew the part to the left, while negative numbers will skew it to the right.

Flipping

You can flip any composite part by selecting it and choosing "Flip…" from the Special menu. Choose the axis of your flip before clicking "OK."

Chapter Twelve

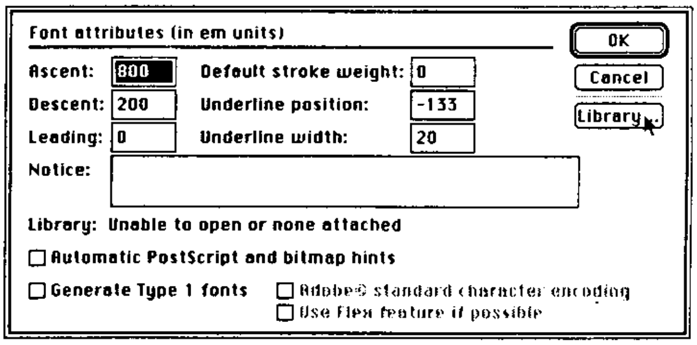
Libraries

Fontographer offers the capability of attaching a ***parts library*** to a font. This library is a normal Fontographer outline source file, but contains parts or master characters. Using a library can speed up the process of creating a font.

A good example of using a library is a font that contains only special characters: bullets, dollar signs, ampersands, etc. When a font is opened as a library, Fontographer uses the file as a "Read only" file, meaning that it cannot be changed, edited, or have the individual character windows opened. However, since it is a "Read only" file, more than one user can reference the library at one time. The only way to edit a library is to open it as a regular font file.

To attach a parts library to your font:

- Open a new or existing font.
- Click on "Library..." in the "Font attributes" dialog box.



Font attributes (in em units)

Ascent: 800

Default stroke weight: 0

Descent: 200

Underline position: -133

Leading: 0

Underline width: 20

Notice:

Library: Unable to open or none attached

☐ Automatic PostScript and bitmap hints

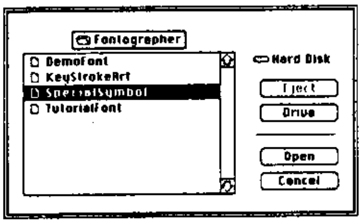
☐ Generate Type 1 fonts

☐ Adobe© standard character encoding

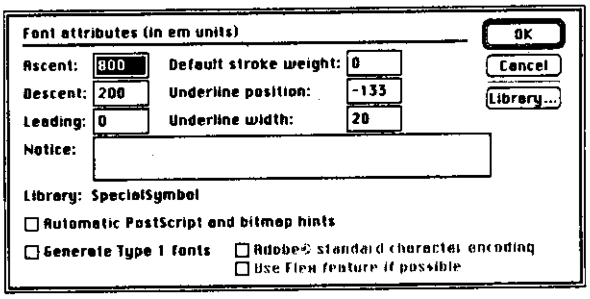
☐ Use Flex feature if possible

A standard file selection dialog will open, which allows you to choose the font you will be using as a library.

In this case, we chose "SpecialSymbol" (which we originally created to store symbols) as our parts library.



When you have chosen a font to be your parts library, the "Font attributes" dialog box will appear again. Now, instead of the library field reading: "Unable to open or none attached," the name of the font appears: SpecialSymbol.



Font attributes (in em units)

Ascent: 800

Descent: 200

Leading: 0

Default stroke weight: 0

Underline position: -133

Underline width: 20

Notice:

Library: SpecialSymbol

☐ Automatic PostScript and bitmap hints

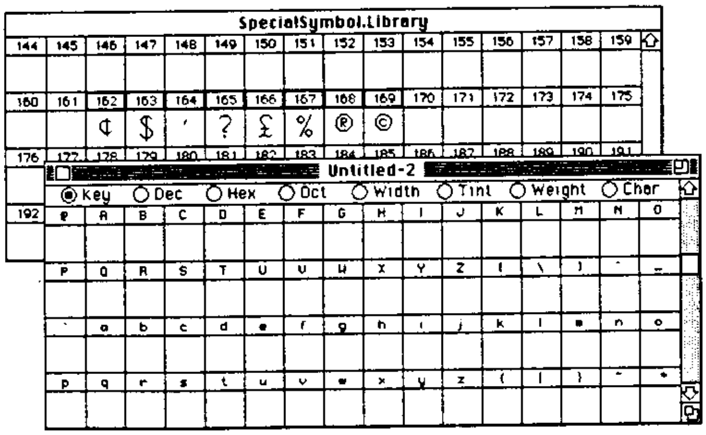
☐ Generate Type 1 fonts

☐ Adobe® standard character encoding

☐ Use Flex feature if possible

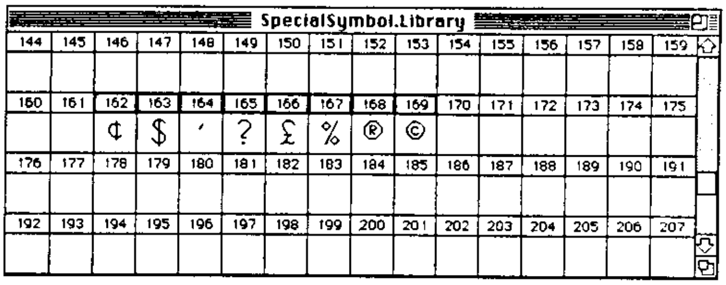
- Click "OK."

The new font opens with the Library font attached.



Library font window

The *library font window* has a standard scroll bar that can be used to scroll through the characters in the library. The title bar shows the name of the library font followed by ".Library." Additionally, the library font window also has a standard grow box (in the lower right-hand corner) to enlarge or reduce the window and a zoom box in the upper right hand corner. Radio buttons are not displayed in this window. Therefore, Fontographer will always default to the Decimal code display. As you can see, the special symbols in the library window could be common to many different fonts; therefore, they only need to be created once. They may then be used in as many fonts as you wish.



SpecialSymbol.Library

144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
		¢	$	′	?	£	%	®	©						
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207

Since this is a "Read only" file, the library window can only be used to "Get part" or "Copy" characters to your new font. If you use the "Get part" command from the Edit menu, all subsequent changes to the library font will automatically be updated when that library font is opened or edited. Using the "Get part" command from the Edit menu brings a reference to the library character into Fontographer's internal clipboard, from which you can then "Paste" that reference into the outline character's foreground. "Copy" will copy the actual outline of the library character into the clipboard.

The "Get part" and "Paste" commands work in the manner described in Chapter Eleven, "Composite Characters."

To paste a character using "Get part:"

- Select a character in the library font window.
- Choose "Get part" from the Edit menu or type ⌘G.
- Select the destination character in the new font file.
- "Paste" the character into the destination character.

Other features of libraries

When you open a font, any attached library automatically opens. When the font is closed, the attached library also closes.

If the library font cannot be located, Fontographer will display an appropriate message.

The name and location of the library font file is maintained with each font. If no references are made to the library font, it will be deleted when the font is saved. Two fonts may share the same library.

A font cannot refer to more than one library. You may "Get part" from the font's corresponding library or from the font itself.

Note: Numerous references to your library font could potentially cause your PostScript file to become large.

Section Four

Additional Information

Chapter Thirteen

Terminology

What is a font?

A *font* (derived from "found," as in typefoundry) of type is a particular style of type in one body-size and one style of face.

On the Macintosh, the distinction between fonts and faces is not always clearcut. For example, the Times-Roman face comes in several sizes of screen fonts, but there is only one master face inside the LaserWriter, which is automatically scaled to the desired point size during printing. Since the distinction between face and font is not clear, we feel justified in using the term "font" to describe both a particular size of a face, and the underlying face itself. When talking about the face in the abstract sense, we shall continue to use the word "face" in its proper sense.

What is a face?

In this case, *face* (typeface) is a complete set of characters which share a similar appearance. Typical methods of categorization consist of measures such as thickness of stroke, angle of the stroke, roundness of letterforms, and many other dimensions which are beyond the scope of this guide. Until Fontographer, the number of typefaces available for the Macintosh was limited.

Family

When speaking about a group of related fonts, we shall use the word ***family*** to describe a related group of faces. The Goudy Oldstyle family used in the text of this manual consists of four fonts: Goudy Oldstyle-Plain, **Goudy Oldstyle-Bold**, *Goudy Oldstyle-Italic*, and ***Goudy Oldstyle-BoldItalic***.

Style

Styles of a face include modifications such as bold, italic, condensed, and extended. Each style should be considered a separate face. The combination of styles makes up a font. A typestyle provides a way to add emphasis to written text. Other styles could be defined: Many faces have condensed and extended versions, and some have light and heavy versions. Ultra-bold is frequently used for headline text. The standard Macintosh names for styled faces are Plain, Bold, Italic, Underline, Outline, Shadow, and sometimes Condensed and Extended. Any combination of these styles is allowed (for example, Bold-Italic-Condensed) but not necessarily encouraged.

Text type

Text type is used for larger masses of text and should be highly readable.

Display type

Display type is generally used for headlines or advertisements and is meant to attract attention. Display type is bold and heavier than text type because it is used in larger point sizes. More often, display type is highly stylized to the point where it is unreadable in small point sizes.

Derived faces

If a particular style of face, say italic, is not available, the Macintosh System display and printing software can simulate it. Such simulations are called *derived faces*. These simulations do not provide a true italic face, but offer a convenient means of accessing more faces than are actually defined. Bold faces are derived by double-striking the character with a slight offset. Outline and shadow effects are derived in diverse ways by different programs.

Serif

Serif letters can be distinguished by the line that crosses the main strokes of a character. Serifs are the short cross-strokes at the ends of letters, drawn there to improve readability of the type. The typeface used in this text is a serif face, Goudy Oldstyle. Another example of a serif face is Times.

Sans-serif

This manual's section headings are *sans-serif* (without serifs). Sans-serif type is generally considered more modern, while serif type is considered more readable. Some typographers have referred to sans-serif typefaces as "grotesque." In the United States, sans-serif letters have been called "gothic," which in Europe refers to black letters. Helvetica is an example of a sans-serif face. The typeface used for our headings in this manual is a sans-serif face, TFForever.

Point size

A letter's type size is measured by its ***point size***. The point system of type measurement was invented in 1737 by Pierre Fourniér, a Parisian typefounder. Fourniér's unit of measurement was 0.349 mm. On the Macintosh, a point is defined as approximately 1/72 of an inch.

The point size of a font is measured as the distance from the ascent line to the descent line. A 14-point font measures 14 points from its ascent line to its descent line.

Em-square

Each character is described in terms of a rectangle called an ***em-square***. The em-square is the outer square around the letter. This square is so named because it is nominally as wide as the letter "M" and the same height.

Ascent

The *ascent line* marks the top of the capital letters. An ascent guideline is automatically drawn at the vertical position specified when the font is created, and may be changed with the "Font attributes" command under the File menu. Characters should not normally go above the ascent line.

x-height

The *x-height* line marks the top of the lower case letters without ascenders or descenders, such as "x" and "o." This line may be positioned anywhere you wish, since it is only a guideline. In general, faces with taller x-heights are perceived as larger and more readable than those with small x-heights.

Baseline

The *baseline* is the imaginary line upon which capital letters sit. When printing mixed fonts on a line, all baselines line up with one another. The baseline position does not need to be explicitly specified, since it is always at a vertical location of zero.

Fontographer Background

Fontographer is a specialized graphics editor that was developed to make PostScript font definition fast and easy. PostScript is segment-oriented. In PostScript, shapes are defined in terms of line segments, arc segments, and curve segments. Fontographer is point-oriented. In Fontographer, shapes are defined in terms of their control points, which may be tangent points, corner points, or curve points. These point types are designed to facilitate smooth letter construction.

Font storage

Fonts are stored in several different ways, depending on their use. The outline information is stored in a special Fontographer font file. Each character is a separate resource in the file and can be accessed independently of other characters. The background and foreground drawing planes of a single character are stored as two separate resources. Guidelines are stored once for the entire font, in their own specially numbered character resource. Fontographer supports all 256 characters of the Macintosh standard character set.

Fontographer has a built-in bitmap font editor. For more sophisticated bitmap editing, use Fontastic Plus, Altsys' bitmap font editor. Fontographer automatically generates bitmap fonts into a font file that is compatible with Apple's Font/DA Mover. You must then install your fonts into the System file so they show up in the font selection menu. If you neglect to install them, they cannot be used by your applications. Chapter Five discusses the installation of bitmap fonts.

When the PostScript file is generated, it is automatically put into a file with a special abbreviated name. For example, the font name "MyFont" would have its PostScript put into the file "MyFon." This file must be moved into the System Folder, as described in Chapter Five, in order to be found for downloading.

Note: Never rename this PostScript file using any method other than Fontographer's.

Em-square

The ***em-square*** is used as a normalization value when generating PostScript and also defines the precision possible in the font. The first information Fontographer asks for when defining a new font is the ascent and descent. The ascent and descent are measured in em-units, as are all measurements in Fontographer. The sum of these two values defines the em-square.

Units

Fontographer ***units*** are dimensionless values. Because PostScript fonts are scaleable, units do not directly relate to points, pixels, or any physical distance. It is possible to relate units to physical distance if the em-square is set up knowing the printing device resolution and scale at which the font is to be printed, but this defeats the whole concept of PostScript. We recommend that you forget about trying to relate units to distance and think of them as dimensionless design units.

Fontographer is capable of defining fonts with an em-square of up to 8,000 by 8,000 units. This range is far greater than needed for any normal font. The fonts built into the LaserWriter have been defined using an em-square of 1,000 by 1000, which is also Fontographer's default. Precise work for the Linotype 100 or 300 might benefit from an em-square of 2,000 or more. The choice of em-square size is left up to you, since only you know the precision required for a particular font.

Choosing a larger em-square means that you have more precision when defining the character, and can accurately work at larger magnification. It does not mean that the printed characters are larger. Since a font is always normalized so that the em-square is one point high, a font defined with an em-square of 4,000 prints out at exactly the same size as a font defined with an em-square of 1,000. It has four times the internal resolution, but that is insignificant on a 300 dot per inch printer except at very large point sizes. A 1,000-point high character (almost 14 inches) would have at most 1/72 inch of inaccuracy if drawn on a 1,000-unit em-square. If drawn with a 4,000-unit em-square, the inaccuracy would be approximately one dot (1/288 of an inch). Proper positioning of the control points, whatever em-square size is used, is more important than greater resolution.

A final consideration when choosing an em-square is storage efficiency. With Fontographer's current font compression scheme, fonts with an em-square of less than 1,600 are somewhat smaller and more efficient than fonts with a larger em-square.

Font ID

Bitmap fonts are identified internally by a unique number ranging between 1 and 16,383. When creating a font you must try to choose a value that does not conflict with those assigned to existing fonts. Fontographer assigns a unique font ID when it creates a new font.

Conflicting font IDs are automatically renumbered by the Font/DA Mover during font installation, but this renumbering can cause confusion when the font is used. Macintosh programs typically identify fonts by ID number, not by name. Thus, when moving a document from computer to computer, the displayed fonts may change if numbering conflicts occurred during font installation. The best way to avoid this problem is to number all your fonts uniquely so the Font/DA Mover does not have to renumber them. We recommend you start with font family ID 1,024 and count up.

Macintosh Background

Bitmap fonts

The Macintosh uses bitmap fonts for screen display and ImageWriter printing. Bitmap fonts are selected from any application which understands fonts. Bitmap fonts are stored in the System file, where they are accessible to all programs. Bitmap fonts cannot be smoothly scaled, so each outline font requires several bitmap fonts in different sizes for display purposes. Allowable sizes may be restricted by the sizes supported in certain Macintosh programs; for example, MacWrite only supports 9, 10, 12, 14, 18, and 24 point characters.

Bitmap fonts are named in such a way that the face name and point size are tied together. For the face named Geneva, for example, there are normally six different sizes: 9, 10, 12, 14, 18, and 24. Since the point size is part of the bitmap font name, this leads to six different bitmap fonts: Geneva-9 through Geneva-24.

The bitmap fonts used for screen display are automatically tied to the PostScript fonts by font name and size. For example, when a document which uses a bitmap font called MyFnt-12 is printed, the print software looks for a PostScript font named MyFnt. The font size is passed on to the PostScript font as a scaling factor.

FOND

A *FOND* is the table that creates the link from the bitmap font to the PostScript font. A FOND is automatically generated by Fontographer whenever a bitmap font is generated. It contains several important types of information.

If PostScript fonts are associated with a family, their Macintosh file names are stored in its FOND. The Macintosh print manager examines the FOND, and if there is a PostScript font file available in the System Folder, it is downloaded to the printer before printing begins. If no PostScript font file is found, or if the FOND does not exist, the bitmap font is used. The PostScript font file must be in the System Folder or in the same folder as the printing application in order to be found for downloading.

The FOND also links all the bitmap fonts in a family so that custom-tuned italic or bold faces may be used in place of the normal derived styles. This component of the FOND is independent of PostScript fonts.

The FOND also provides fractional character width information. Fractional character width tables allow line breaks and exact character positions to be calculated with far greater precision than was supported by the previous FONT width tables. Horizontal character positioning can be as accurate as 1/4096th of the point size, which should be enough for even the most discerning typographer. Individual letters must still start on a whole-number device coordinate of the screen or printer, but overall line lengths may now be calculated with almost no cumulative error. Horizontal positioning is as accurate as the resolution of the output device.

The FOND also stores kerning pair tables. The kerning pair tables list the left character, the right character, and the space adjustment to be applied between the two. Again, the accuracy here is 1/4096th of the point size.

PostScript Background

PostScript is a programming language developed by Adobe Systems, Inc. to drive high-resolution printers. Invented as a standard page description language with a well-documented behavior, it is used on printers produced by a number of different manufacturers.

PostScript's generality allows any picture to be described as a program; this is how fonts are constructed. Each letter is described by a small program which draws the letter outline using geometric primitives. In order to print the character on a page, this character drawing program is run by the printer control software to draw and fill the outline, generating a bitmap. The bitmap is generated at the current point size, and then copied to the page at the appropriate location.

Caching

Translating from the program into a bitmap is a complex process which takes an amount of time proportional to the complexity of the character. To minimize the amount of time spent generating bitmaps from the letter drawing programs, the bitmaps are saved on the printer's hard disk or in memory for later use. This saving process is called *caching*. The first time a particular letter is printed, its bitmap must be generated and cached before it can be drawn on the page. Once a letter has been converted, its bitmap is normally found in the cache, and is used directly.

13

Bézier curves

The geometric primitives available from PostScript are straight lines, arcs, and *Bézier curves*. A Bézier curve has control points which allow changing the shape of the curve. An arc has uniform curvature everywhere, but a Bézier curve allows non-uniform curvature. This property is useful in describing complex shapes with only a few well-chosen control points. Additionally, Bézier curves have desirable smoothness properties which lend themselves to efficient generating programs.

Another useful property of Bézier curves is that it is very easy to guarantee smooth joins at the endpoints of the curve. Smooth tangent joins are very important to high quality letter shapes. Fontographer supports automatic tangent joins during character construction, so its characters are perfectly smooth where they should be smooth (but can be discontinuous if necessary).

Paths

A ***path*** is composed of line or curve segments. These segments may be connected (the normal case) or disconnected (such as the dot on a lower-case "i"). Paths may be ***open*** or ***closed***. A segment of a path is closed if the last point connects back to the first point, otherwise it is open. Unless a character is explicitly declared to be unfilled (Fontographer's "Character info…" dialog allows filling to be turned off), PostScript always closes and fills all paths.

Characters may consist of open paths or closed paths, but not both. Normally a character is constructed such that its outline is defined as a single closed path. The program that generates the bitmap can then just fill in the outline. Some characters, such as the letter "O," have an inside and an outside. A simple-minded approach to filling such a letter would fill both outlines, resulting in a single solid circle. To handle this case, PostScript has two sophisticated approaches to filling.

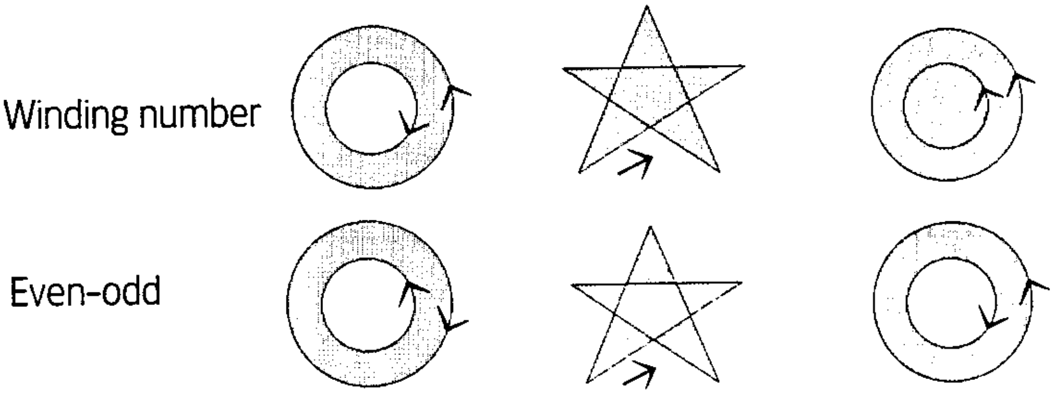
Winding number fill

The standard PostScript filling technique is called a ***winding number fill*** which is the "Normal" option in Fontographer's "Character information" dialog. This relies on one path being described in a clockwise direction, and the other path being described in a counterclockwise direction. A point is outside, and thus not filled, if a line away from that point in any direction crosses exactly as many counterclockwise paths as it crosses clockwise paths. In the case of the "O," the outer path should be drawn clockwise and the inner path counterclockwise.

Technically, it doesn't make any difference whether the outside path is clockwise or counterclockwise, but for the sake of consistency between Fontographer's fonts and the proper operation of automatic hints, the outer paths should be clockwise and the inner paths counterclockwise.

Even-odd fill

The other filling technique is called an ***even-odd fill***. A point is outside, and thus not filled, if a line away from that point in any direction crosses an even number of paths, regardless of the path direction. In the case of the "O," even-odd filling would have the desired result even if both paths were clockwise.



Metrics

PostScript stores auxiliary information in the character *metrics* table. This contains information such as the ***width*** of the character, its ***origin***, and its ***bounding box***. This table is generated automatically by Fontographer as you edit the character. The only direct user interaction with the character metrics is specification of the character width. The width is the distance by which the drawing pen is advanced before starting the next character. The origin point of the current character is aligned with the width point of the previous character before drawing the current character.

Type 3 fonts

*Type 3 **fonts***, sometimes referred to as user-defined fonts, are the most flexible and general type of PostScript fonts. Type 3 fonts have some advantages over Type 1 fonts.

- Type 3 fonts can contain complex composite characters.
- Type 3 fonts can contain gray strokes and fills.

However, since Type 3 fonts do not use the special built-in mechanisms of Type 1 fonts, they can take longer to print and use more printer memory. Fontographer can automatically place hints into your Type 3 fonts as well as your Type 1 fonts.

Type 1 fonts

Type 1 fonts are a special type of PostScript fonts with hints. There are some advantages in using Type 1 fonts over Type 3 fonts.

- Type 1 fonts are filled using a better technique, so they look lighter and more delicate on the page.
- Type 1 fonts are more compact, since part of the font is built into the printer.
- Type 1 fonts are compatible with Adobe Type Manager™, so that all sizes can be rendered on screen smoothly.

LaserWriter Background

Downloading

Downloading is the means by which the font description is sent to the printer from the Macintosh. This normally takes place over an AppleTalk™ network.

The LaserWriter contains a powerful computer which allows it to accept a variety of fonts and graphics commands expressed in PostScript. In particular, it can accept new typefaces through the process of downloading.

The LaserWriter has two important types of built-in memory. The first is ROM (Read-Only Memory) which is unchangeable. ROM holds its information indefinitely, even when the power is turned off. The basic printer control program and several typefaces are programmed into the ROM and thus are not changeable. The second type of built-in memory is RAM (Random-Access Memory) which can be changed. However, RAM loses its contents each time the power is turned off. Downloaded fonts are put into RAM, as is the image of the page to be printed. RAM has enough space to hold three to five fonts, depending on their complexity.

Both outline fonts and bitmap fonts may be downloaded into RAM, so the Macintosh is able to print documents using bitmap fonts when the outline font is unavailable. However, the process is very slow, due to the way bitmap fonts are used. Downloaded fonts can further be divided into two classes: permanent and transient.

Permanent fonts

Permanent is a misnomer here, since the ***permanent fonts*** are only semi-permanent. Unless you have a hard disk attached to your printer, permanent fonts are downloaded once, and remain available until the LaserWriter is turned off. If your printer does have a hard disk attached, you can download your fonts permanently to the hard disk.

Permanent fonts are good for those installations which do a considerable amount of processing, using just a few frequently used fonts, and don't want to incur the overhead of downloading them with each printed document.

Transient fonts

Transient fonts are downloaded each time a document is printed, and remain resident only while that document is being printed. The printing program flushes them from memory, either at the end of a document (as with most Macintosh software) or the end of a block of text (as with PageMaker). Transient fonts allow a huge variety of fonts to be used without filling the LaserWriter's memory.

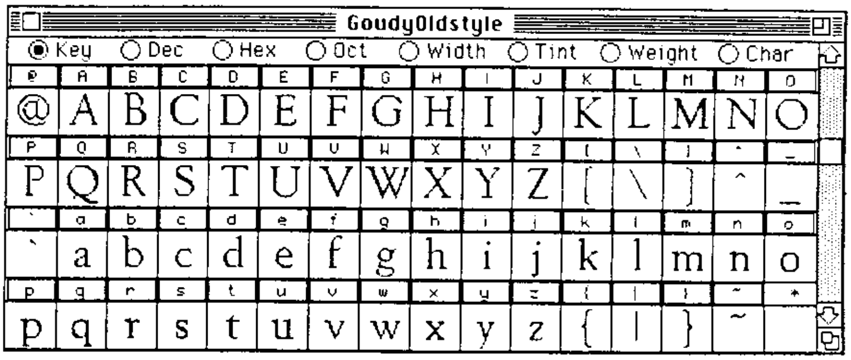
You can make the decision between permanent and transient at any time; simply run the LaserWriter Font Utility program on fonts which you wish to install permanently.

Automatically downloading a font takes only 15-20 seconds, so the price of transient fonts is quite low. Altsys recommends that you use transient fonts in most cases. The download time is insignificant when compared with the problems caused by filling up the printer's memory with permanent fonts.

Chapter Fourteen

Windows...

Font window



The *font window* shows you all the defined characters in your font. If you have just created some new characters and want to see them, you'll have to "Generate fonts..." from the File menu. The default bitmap font size that shows in this window is 24 points. A special copy of the 24-point size is always kept in the Fontographer outline source file so that you'll always be able to see the characters you've created.

The buttons at the top of the window allow you to change the legend over each character slot. The default button is the *Key* button, which shows the keypress(es) required to obtain the character in the slot. If you scroll the window down so that you can see the international symbols, you will see some cryptic things like SOe and Oee. SOe means that to produce this character you will need to press the ***Shift key***, the ***Option key***, and the "e" ***key*** simultaneously, producing the character "‰." In the case of Oee the procedure is slightly different: press the ***Option key*** and the ***"e" key*** simultaneously, then let up on them and press the ***"e" key*** by itself, producing "é."

Radio buttons

Key

The *Key* button corresponds to the keyboard sequence used to enter the character.

Dec

The button labeled *Dec* shows the decimal value of the coded ASCII number that will produce the character in the slot.

Hex

The *Hex* button shows hexadecimal (base 16) values.

Oct

The *Oct* button shows octal (base 8) values.

Width

The ***Width*** button shows the character's width in em-square units. Em-square units are not related to point size or any other physical measurement.

Tint

The ***Tint*** button shows the percentage of black that will fill the character.

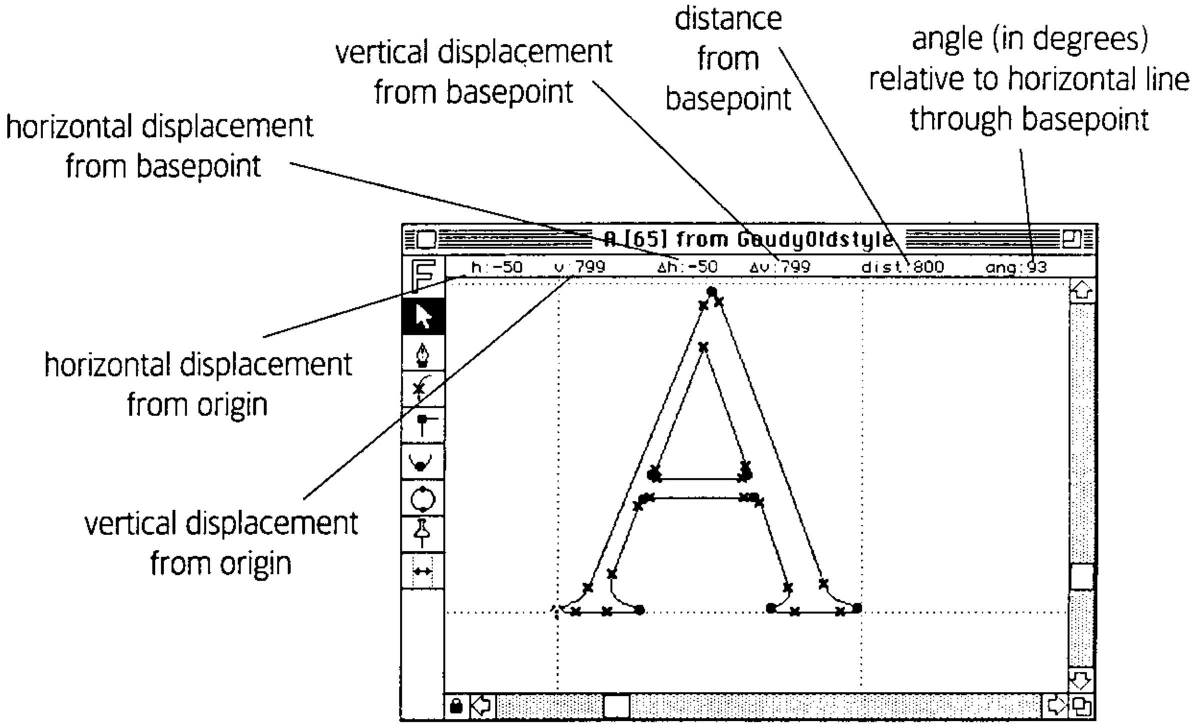
Weight

The ***Weight*** button shows the character's stroke weight in em-square units.

Char

The ***Char*** button shows the system character that corresponds to each slot in the font window. For example, Oee in key mode becomes é in Char mode.

Outline edit window


distance from basepoint
vertical displacement from basepoint
angle (in degrees) relative to horizontal line through basepoint
horizontal displacement from basepoint
horizontal displacement from origin
vertical displacement from origin
A [65] from GoudyOldstyle
h: -50
v: 799
Δh: -50
Δv: 799
dist: 800
ang: 93

The ***outline edit window*** shows you the outlines (or strokes) of the character named in the title bar and allows you to edit them. At the top of the window are some position indicators. The number that follows the **h:** is the number of em-square units the pointer is horizontally displaced from the origin. The number after the **v:** is the number of em-square units the pointer is vertically displaced from the origin. The **Δh:** tells you how far the pointer is horizontally from the basepoint (which can be moved from its normal position at the origin). The **Δv:** tells you how far the pointer is vertically from the basepoint. The **dist:** number is the distance the pointer is from the basepoint. The **ang:** number is the angle (in degrees) that a line drawn from the pointer to the basepoint would make.

Plane Indicators

The *plane indicator* is the first icon at the top of the toolbox. It shows which plane is currently active.

This indicator means you are editing in the *foreground* plane. The foreground plane is where you will create and edit your outline character.

This indicator means you are editing in the *background* plane. Any points you draw with here will not be used for PostScript creation, but will show gray in the other two planes. You can also paste PICT artwork or scanned images into the background plane for hand tracing or autotracing. Each character in the font has its own background plane.

This indicator means you are editing in the *guidelines* plane. If you drag from the origin lines, you can create vertical or horizontal guidelines that will show up behind every character in the font. Any outlines you draw here will not be used for PostScript creation, but will show up gray behind all the characters in the font. There is only one guidelines plane for all the characters in a font.

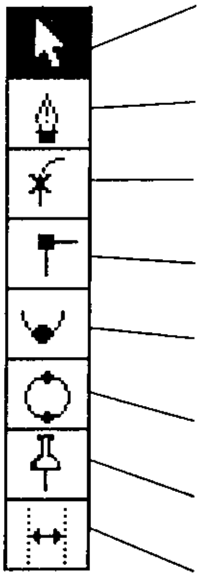
When the lock icon is in the locked position, Fontographer allows you to change planes simply by typing "f," "b," or "g."

When the lock icon is in the locked position, you can also hide the foreground, background, and guidelines planes from view.

- **Hold down the Option key and type "f" to hide the foreground plane from view. Repeat to bring the foreground plane back into view.**
- **Repeat this procedure to hide the background and guidelines plane, substituting "b" and "g" for the "f."**

Tools

The *tools* in the toolbox at the left of this window are explained in more detail below, but here's a shortened explanation of their functions:



Pointer tool: used for selecting and moving paths, points, pictures, and guidelines

Pen tool: used for continuous drawing of a path

Tangent tool: used for placing tangent points

Corner tool: used for placing corner points

Curve tool: used for placing curve points

Circle tool: used for creating circles

Basepoint tool: used for setting the basepoint

Width tool: used for changing a character's width

The lock at the bottom of the window indicates that you cannot change from the character in the character edit window to some other character by merely typing the keystroke(s) of that character. If you click on the lock, it will open and you will then be able to change characters simply by typing the keystroke(s) of the new character. You can also toggle the lock icon on and off by pressing the Return or Enter key. The state of this lock gets saved when you "Quit" the program.

Magnification

You can change the magnification of this window with the "Enlarge" and "Reduce" items in the View menu or you can use keyboard shortcuts.

To increase the magnification, hold down the ⌘ and Space keys and click on the place you want to center in the window.

To reduce the magnification, hold down the Option, ⌘, and Space keys and click in the window. When used by itself, the Space key switches the current tool to a hand tool that will allow you to scroll the character back and forth in the window.

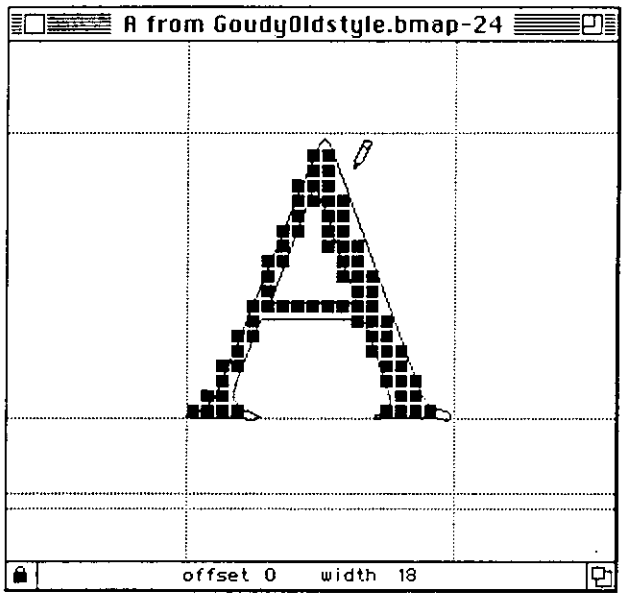
Switching characters

If you need to change the character in the character edit window to the next sequential character, you can use the View menu's "Next char" item or hold down the ⌘ key and type "]."

To change to the previous sequential character, use the View menu's "Previous char" item or hold down the ⌘ key and type " [." When the lock icon is off, you can change characters simply by typing in the character.

Bitmap edit window

The *bitmap edit window* allows you to edit the various sizes of bitmap fonts that Fontographer creates. It works very much like FatBits in a paint-type program. You will use a pencil to turn the dots in the bitmap on or off. The character's outline is visible as a background to help you place the dots properly. Each of the dots in this window is equivalent to one point (pixel) on the Macintosh screen.



Bitmap edit window

At the bottom of the window is a lock. When the lock is closed, you will not be able to change characters by merely typing the keystroke(s) for the new character. If you click on the lock, it will open and you will be able to change characters by simply typing the keystroke(s) of the new character.

Offset/Width

To the right of the lock are the character's offset and width numbers. The offset is the number of points between the origin line and the leftmost point in the character. The letter "A" in the picture of the bitmap window on the previous page has its leftmost point just to the right of the origin line, thus its offset is zero. The width indicator shows us the width of the character in points: The "A" is 18 points wide.

Magnification

You can change the magnification of this window with the "Enlarge" and "Reduce" items in the View menu or you can use keyboard shortcuts: to enlarge the fatbits' magnification, hold down the ⌘ and Shift keys and click anywhere in the window. To reduce the fatbits' magnification, hold down the Option, ⌘, and Space keys and click anywhere in the window.

Scrolling

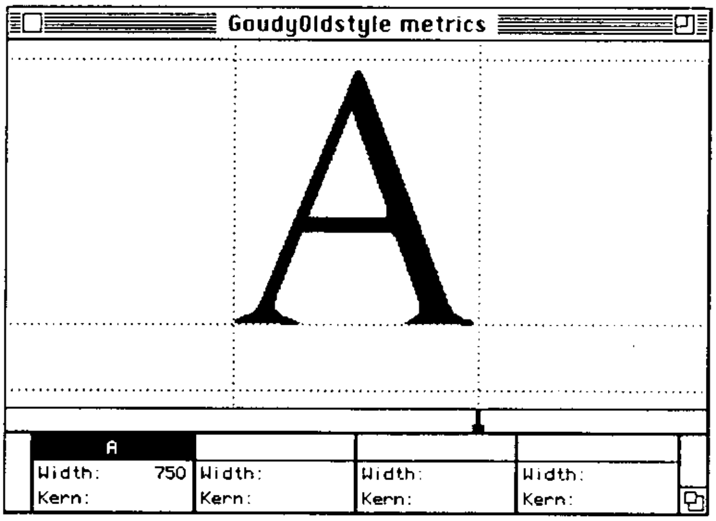
The Space bar switches the pencil to a hand tool that will allow you to scroll the character back and forth in the window.

Switching characters

To change the character in the window to the next sequential character, hold down the ⌘ key and type "]." To change to the previous sequential character, hold down the ⌘ key and type "[."

Metrics window

The *metrics window* shows you a preview of up to ten characters and allows you to edit widths and kerning pairs for those characters. Underneath each character is an inverted T (T-bar) indicator that can be dragged left or right to change the width of the character on the left. Holding down the Option key while dragging the control will change the kerning of the character on the left with respect to the character on the right. Changes to the kerning and width show up in the selected (highlighted) slot below the control area. Width is the distance in em-units between the origin point and the width line. Kern is the number of em-units the character on the right overlaps (negative) or is pushed away from (positive) the character on the left.



GoudyOldstyle metrics

A
Width: 750
Kern:

Width:
Kern:

Width:
Kern:

Width:
Kern:

Metrics window

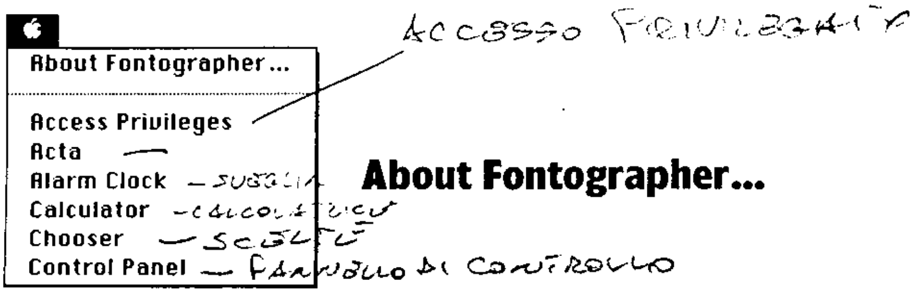
The keys to using the metrics window are:

- The Tab key allows you to move between slots from left to right.
- The Shift-Tab key allows you to move between slots from right to left.
- Typing a character when a slot is highlighted changes the character in that slot.
- Select (highlight) the slot for the letter on the left to manipulate a pair's kerning.

Key commands to change spacing and/or kerning:

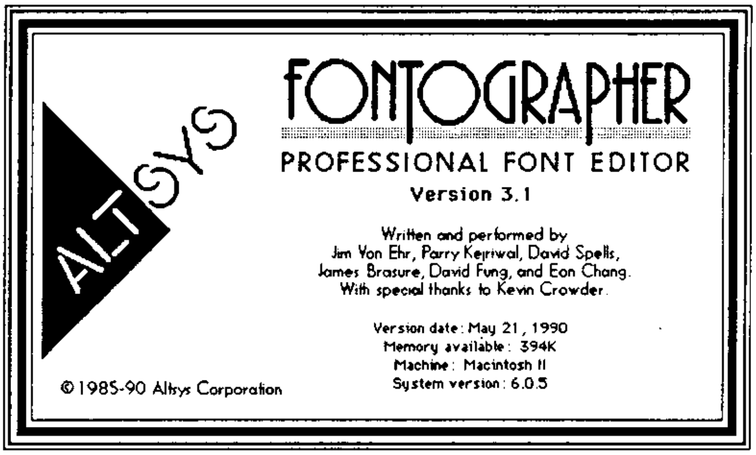
- The left and right arrows will change the width of the selected character by one em-unit.
- The Shift-left and right arrows will change the width of the selected character by 10 em-units.
- The Option-left and right arrows will change the selected kerning pair value by one em-unit.
- The Shift-Option-left and right arrows will change the selected kerning pair value by 10 em-units.

Menus...


About Fontographer...
Access Privileges — Accesso Privilegiati
Acta —
Alarm Clock — sveglia
Calculator — calcolatrice
Chooser — scelta
Control Panel — pannello di controllo

About Fontographer...

This dialog shows you information you may need if you have problems with Fontographer. You can see the version number below the program title. The figure you see for memory available is given in either K (kilo: 1024) or Meg (mega: 1,048,576) bytes. Fontographer also displays the type of machine you have and which version of Apple's System software you are running.



FONTOGRAPHER
PROFESSIONAL FONT EDITOR
Version 3.1

Written and performed by
Jim Von Ehr, Parry Kejriwal, David Spells,
James Brasure, David Fung, and Eon Chang.
With special thanks to Kevin Crowder.

Version date: May 21, 1990
Memory available: 394K
Machine: Macintosh II
System version: 6.0.5

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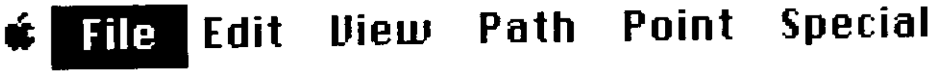
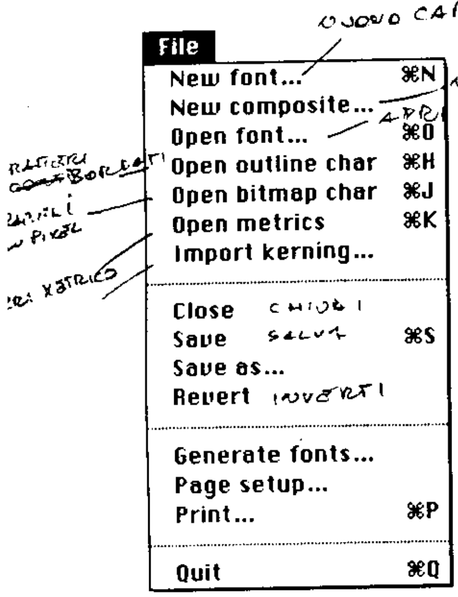
Desk Accessories

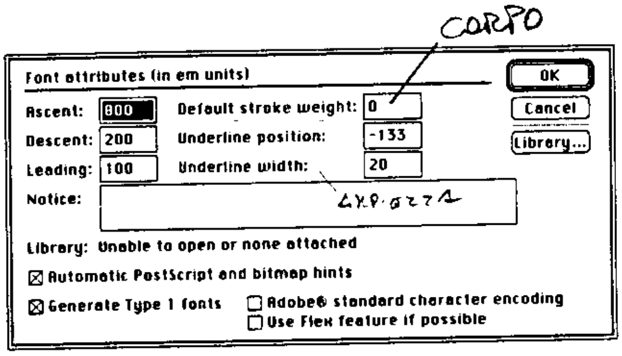
Desk accessories appear below the "About Fontographer..." item and can be selected in the normal fashion.





New font...

All the numbers in this dialog are in em-square units. You will notice that the "Ascent" and "Descent" normally default to a sum of 1,000 units. "Leading" is normally left at 0.



Font attributes (in em units)

Ascent: 800
Default stroke weight: 0
Descent: 200
Underline position: -133
Leading: 100
Underline width: 20
Notice:

Library: Unable to open or none attached

☒ Automatic PostScript and bitmap hints

☒ Generate Type 1 fonts
☐ Adobe® standard character encoding
☐ Use Flex feature if possible

The "Default stroke weight" is the stroke weight which will be used if no other stroke weight has ever been specified for an individual character. A stroke weight of zero is not a non-existent stroke: PostScript defines a zero stroke width as a line of the smallest possible width.

By defining a stroke weight for an individual character with the "Char info..." item in the Edit menu, you will override the default stroke weight for that character.

Since a PostScript underline is accomplished by defining a stroked line a certain distance from the bottom of the character, the "Underline position" entry allows you to change the distance between this stroked underline and the characters above it. The default of -133 indicates that this line will be drawn 133 units below (-) the origin point. The "Underline width" indicates how wide the underline should be; the default is 20 units.

You can put any text in the "Notice" you wish, but it must be limited to 100 characters or less. Normally you will put a copyright notice here.

If there is a library attached to this font, you will see its name next to the "Library" entry. If you want to attach some other font file as a library for this font, you can use the "Library..." button. You will see a Standard File dialog which will allow you to attach any Fontographer outline file as a library for this font.

If you check the "Automatic PostScript and bitmap hints" box, Fontographer will automatically generate hints in your PostScript fonts and will use the same hints to help make your bitmap fonts look better. This will make subtle improvements in the appearance of your fonts, especially at smaller sizes. Printing might take a little longer, but it is usually best to check this box if you want the highest quality fonts.

If you check the "Generate Type 1 fonts" box, Fontographer will generate Adobe Type 1 fonts. If you check the "Adobe® standard character encoding" box, Fontographer generates a font with Adobe encoding.

If you check the "Use Flex feature if possible" box, Fontographer applies subtle effects (Flex) to cupped serifs and tapered stems. Garamond is a good example of a font that would need Flex to properly render its serifs.

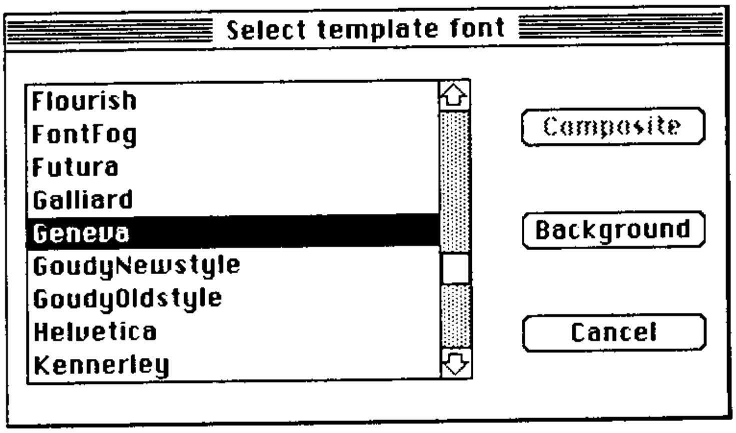
Note: If you change the encoding and regenerate a Type 1 font from an existing font file, you must regenerate, then remove and reinstall the bitmaps. If you do not do this, the last 128 characters of the font will be incorrect.

X nuovi caratteri

New composite...

If you need to add special characters to your font, or recover the outline file for a font resident in your printer, or access a Type 3 font that isn't compatible with Fontographer, you will click on the "Composite" button.

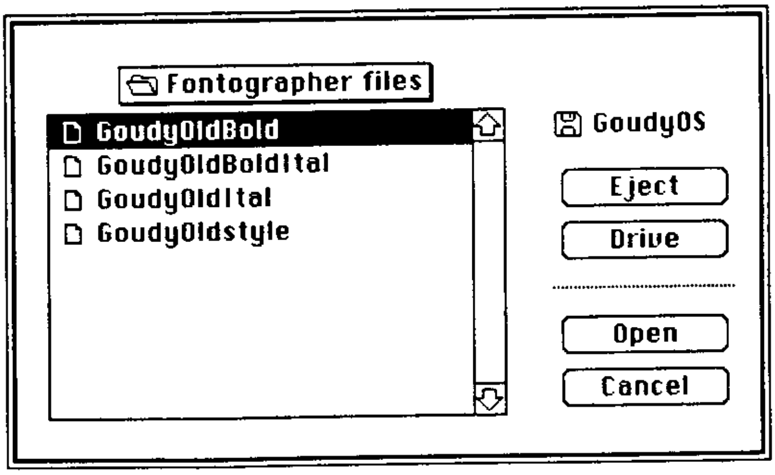
If you select a bitmap font in this dialog, the "Composite" button will be grayed out.



You can use bitmap fonts only as backgrounds for tracing, not as PostScript composites, since there is no PostScript to refer to. For best results make sure that the bitmap font you choose has a very large size: 72 points is a good minimum.

Open font...

"Open font..." shows you a standard file dialog which allows you to open a Fontographer outline file or a Type 1 PostScript font.



Open outline char

Opens the outline edit window.

Open bitmap char

Opens the bitmap edit window.

Open metrics

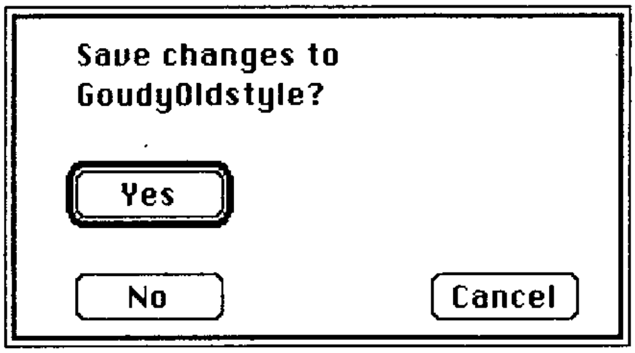
Opens the metrics window.

Import kerning...

Imports kerning pairs from Adobe Font Metrics (AFM) files or bitmap font files.

Close

Closes the active window. If you have made changes, Fontographer will ask you if you want to save your changes.



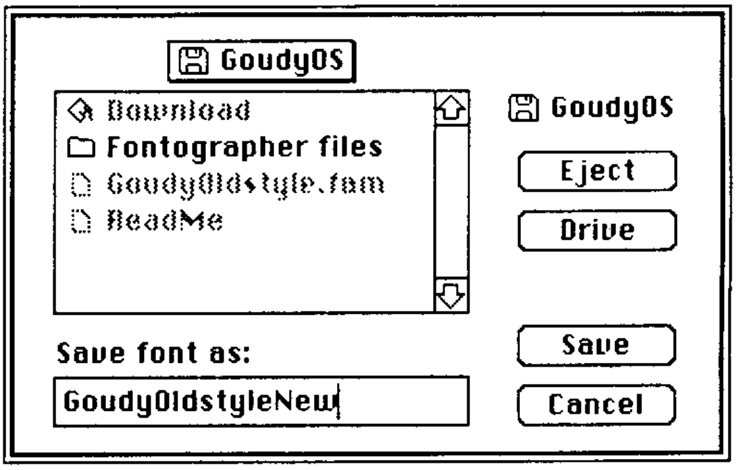
Save changes to GoudyOldstyle?

Save

Saves any changes you have made since opening the font.

Save as...

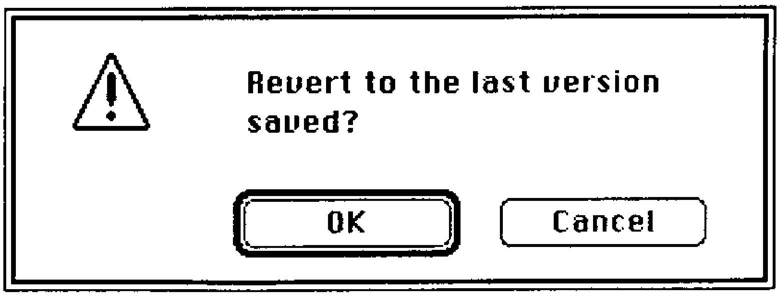
Allows you to save your font to a new name. If you want to change your font's name, this is the way to do it.



Save font as: GoudyOldstyleNew

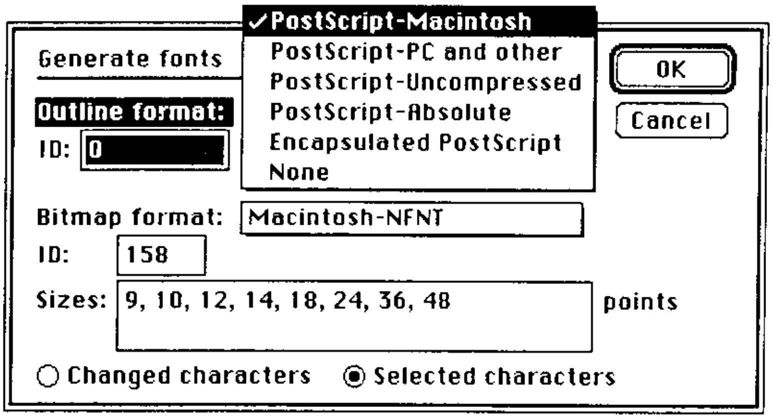
Revert

Restores your font to the last saved version on the disk, throwing away any changes you may have made since you last saved it. You must revert from the font window.



Revert to the last version saved?

Generate fonts...



Generate fonts

Outline format: PostScript-Macintosh
ID: 0

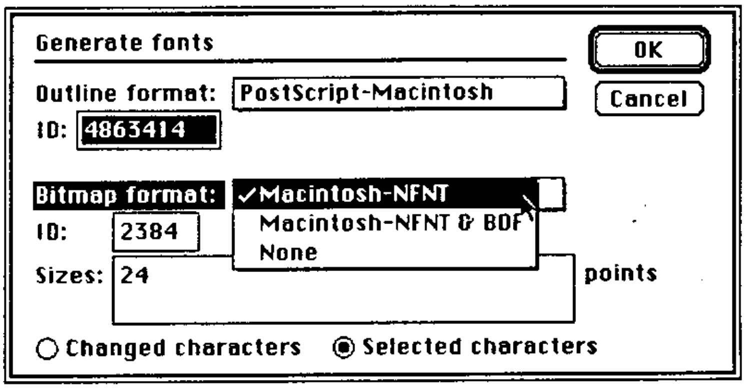
Bitmap format: Macintosh-NFNT
ID: 158
Sizes: 9, 10, 12, 14, 18, 24, 36, 48 points

○ Changed characters ● Selected characters

The "Generate fonts..." dialog produces Fontographer's end result: a PostScript font file and a bitmap font file with various sizes of bitmap fonts in it.

The "Outline format" popup menu allows you to change the format of the PostScript font file. The default choice is "PostScript-Macintosh." "PostScript-PC and other" produces a text file containing compressed PostScript suitable for porting to other computers that can download PostScript text files. The "PostScript-Uncompressed" item produces a text format that allows you to edit the text of the PostScript file directly. "PostScript-Absolute" is provided for those who wish to have absolute coordinates in their PostScript files. The "Encapsulated PostScript" option is provided for those who wish to generate Adobe Illustrator 1.1-style EPS (Encapsulated PostScript) format files. Programs such as Aldus FreeHand and Adobe Illustrator can read this file format directly for editing purposes. If you choose the "None" item, Fontographer will not generate an outline file. Normally you will use this option when you are fine-tuning the bitmap output and do not wish to regenerate the outline file. If you make any choice other than "None," Fontographer always regenerates the entire outline file—you cannot regenerate only selected characters (except when generating an EPS file).

The "PostScript ID" field allows you to set your own PostScript ID. Fontographer automatically generates Font IDs in the range 4,000,000 to 4,999,998.



Generate fonts

Outline format: PostScript-Macintosh

ID: 4863414

Bitmap format: ✓Macintosh-NFNT

ID: 2384

Sizes: 24 points

○ Changed characters ● Selected characters

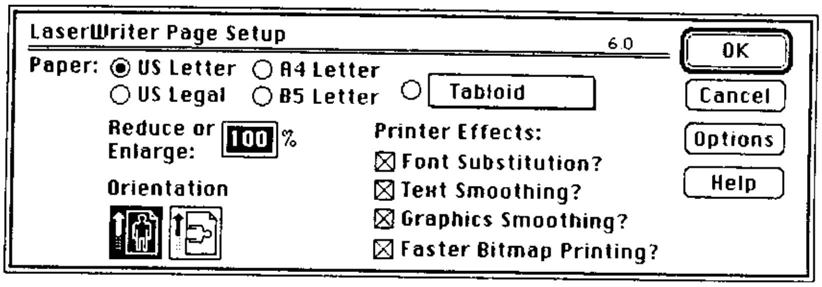
The "Bitmap format" popup menu allows you to either generate Macintosh NFNTs, BDFs or none. If you have edited the bitmap images of your font in the bitmap edit window, you will want to make sure you do not regenerate those bitmaps, thus wiping out your careful editing. Choose the "None" item when you don't want to disturb your bitmap edits, or click in either "Changed characters" or "Selected characters" to regenerate only some of the bitmaps.

The "ID" number range you should use is 1,024 to 3,070. IDs between 3,071 and 16,384 are reserved for commercial font developers and should be avoided unless you are a commercial developer of fonts and have contacted Apple Computer on AppleLink address FONT.REG.

The "Sizes" box tells Fontographer which bitmap font point sizes to generate. In the "Sizes" box you can type any bitmap point sizes between 1 and 256. If you remove sizes from the list, Fontographer will warn you before deleting those sizes.

Page setup...

The only option that Fontographer uses from this dialog is the "Orientation" option, which can be either vertical (default) or horizontal. You should check the "Page Setup" before printing.



LaserWriter Page Setup 6.0

Paper: ● US Letter ○ A4 Letter ○ US Legal ○ B5 Letter ○ Tabloid

Reduce or Enlarge: 100 %

Orientation

Printer Effects:

☒ Font Substitution?

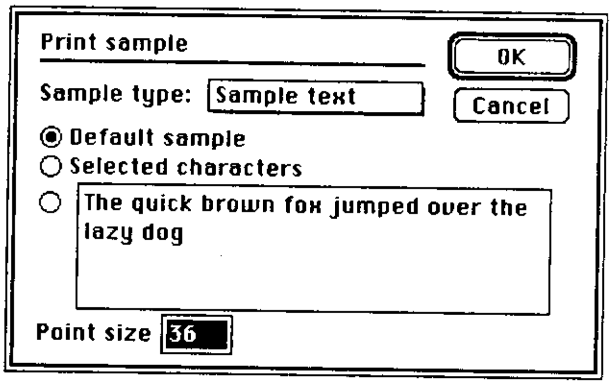
☒ Text Smoothing?

☒ Graphics Smoothing?

☒ Faster Bitmap Printing?

Print

Fontographer prints samples to PostScript printers only.



Print sample

Sample type: Sample text

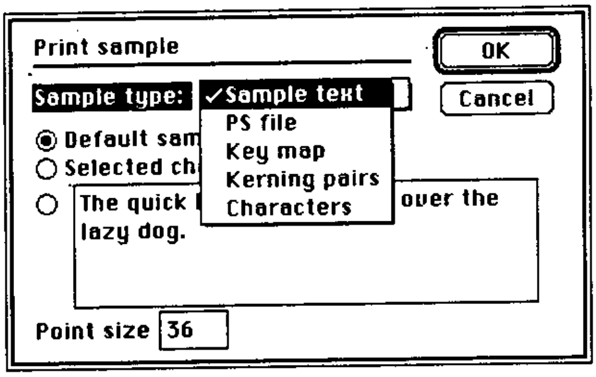
● Default sample

○ Selected characters

○ The quick brown fox jumped over the lazy dog

Point size 36

The "Print sample" dialog allows you to choose the format of your sample printouts. The default "Sample text" is simply a string of all the characters in the font. You can change the size of the sample printout by typing in a value different from the default point size of 36. The other options in the "Sample type" allow you to print out information helpful to perfecting your font.



Print sample

Sample type: ✓Sample text

● Default sam

○ Selected ch

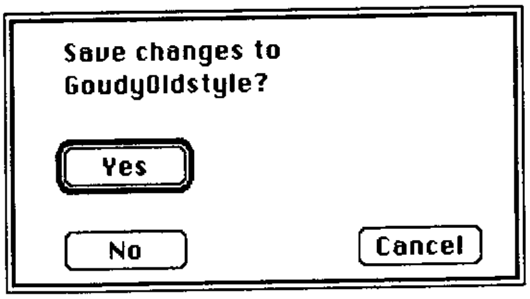
○ The quick … over the lazy dog.

Point size 36

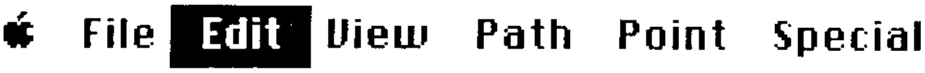
The "PS-file" option allows you to find a PostScript font file on your disk and use it to print a sample of your font. There are two PostScript sample files on Fontographer's "Tools & Utilities disk:" PSSample and PSKernPairs. The "Key map" option prints page maps of all the keystrokes in your font with indications as to each keystroke's width, offset, and decimal ASCII code. The "Kerning pairs" option prints a list of all the kerning pairs in the font along with their kerning values in em-square units. The "Characters" Sample type provides you with the option of printing a sample that shows the X/Y coordinates of the points of the character, in addition to allowing you to print individual character samples at varying sizes.

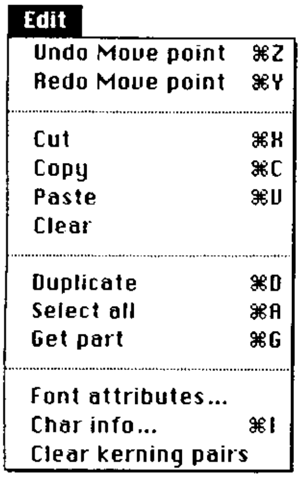
Quit

If you "Quit" without saving some changes you have made, Fontographer will ask if you want to save those changes. You can discard those changes by clicking the "No" button.



Save changes to GoudyOldstyle?





Undo

Fontographer has eight levels of "Undo." This means that you can "Undo" the last eight things you changed in Fontographer. The operation that can be undone will appear in the menu after the "Undo" if you are using the character edit window or bitmap edit window.

Redo

"Redo" allows you to undo an "Undo."

Cut

"Cut" deletes the selected object(s) and puts them in the clipboard.

Copy

"Copy" makes a copy of the selected object(s) and puts them in the clipboard.

Paste

"Paste" takes the object(s) in the clipboard and puts them into the selected window or character slot.

Clear

"Clear" deletes the selected object(s) without doing anything to the clipboard.

Duplicate

"Duplicate" makes a copy of the selected object(s) and leaves it on the screen slightly displaced from the original(s).

Select all

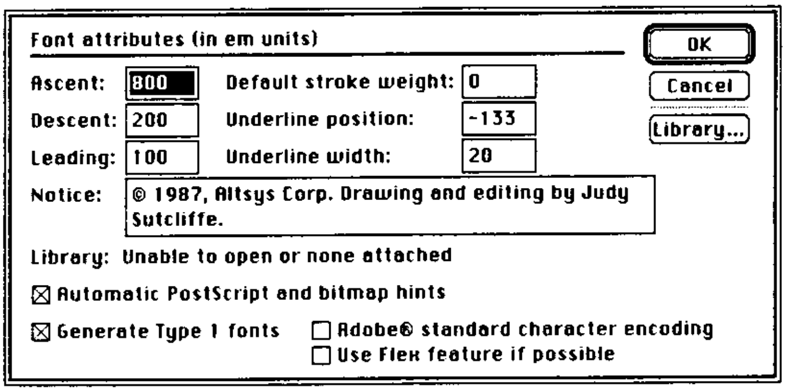
"Select all" selects everything in the currently active window and plane.

Get part

"Get part" copies a reference to a selected character into the clipboard, which can then be pasted to allow layered objects or the reuse of a parts library in several different characters. You must use "Get part" instead of "Copy" if you wish to create a layered character.

Font attributes...

All the numbers in this dialog are in em-square units. You will notice that the "Ascent" and "Descent" normally default to a sum of 1,000 units. Leading is normally left at 0, but if you must set it, a good setting is 10% of the sum of the ascent and descent.



Font attributes (in em units)

Ascent: 800
Default stroke weight: 0
Descent: 200
Underline position: -133
Leading: 100
Underline width: 20
Notice: © 1987, Altsys Corp. Drawing and editing by Judy Sutcliffe.
Library: Unable to open or none attached

☒ Automatic PostScript and bitmap hints

☒ Generate Type 1 fonts
☐ Adobe® standard character encoding
☐ Use Flex feature if possible

The "Default stroke weight" is the stroke weight that will be used for a character.

Since a PostScript underline is accomplished by defining a stroked line a certain distance from the bottom of the character, the "Underline position" entry allows you to change the distance between this stroked underline and the characters above it. The default of -133 indicates that this line will be drawn 133 units below (-) the origin point. The "Underline width" indicates how wide the underline should be; the default is 20 units.

You can put any text in the "Notice" you wish, but it must be limited to 100 characters or less. Normally you will put a copyright notice here.

If there is a library attached to this font, you will see its name after "Library." If you want to attach some other font file as a library for this font, you can use the "Library..." button. You will see a Standard File dialog which will allow you to attach any Fontographer outline source file to this font.

If you check the "Automatic PostScript and bitmap hints" box, any bitmaps you create will be better looking and the PostScript you output will take a little longer to print, but will look much better. It is usually best to check this box if you want the highest quality fonts.

If you check the "Generate Type 1 fonts" box, Fontographer will generate Adobe Type 1 fonts.

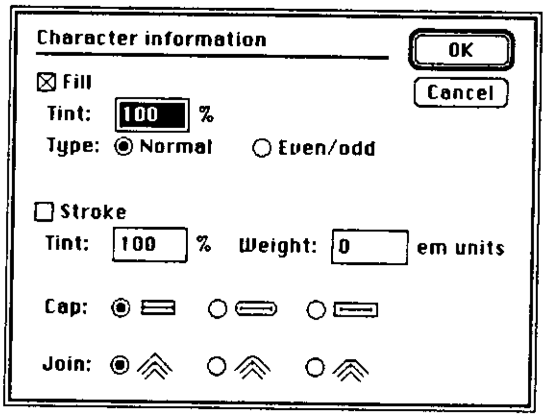
If you check the "Adobe® standard character encoding" box, Fontographer generates a font with Adobe encoding. Do not check this option if your fonts have all the upper 128 characters defined.

If you check the "Use Flex feature if possible box," Fontographer will apply subtle effects (Flex) to cupped serifs and tapered stems.

Note: If you change the encoding and regenerate a Type 1 font from an existing font file, you must regenerate, then remove and reinstall the bitmaps. If you do not do this, the last 128 characters of the font will be incorrect.

Char info...

The "Char info..." dialog allows you to change the fill and stroke characteristics of individual characters. Normally a character will be either filled or stroked, but you can use this dialog to create characters that are both filled and stroked. The "Cap" and "Join" options allow you to set the characteristics of a stroked font.



Character information

☒ Fill
Tint: 100 %
Type: ● Normal ○ Even/odd

☐ Stroke
Tint: 100 % Weight: 0 em units
Cap: ● ○ ○
Join: ● ○ ○

Fill

If the "Fill" box is checked, you can change the percentage of black with the "Tint" option: 100% is black; 0% is white.

The "Normal" PostScript fill will fill between paths that are alternately clockwise and counterclockwise.

The "Even/odd" fill will fill between every even/odd pair of paths, starting with the outermost path.

Stroke

If the "Stroke" box is checked, you can change the percentage of black which fills the stroke with the "Tint" option: 100% is black; 0% is white.

Weight

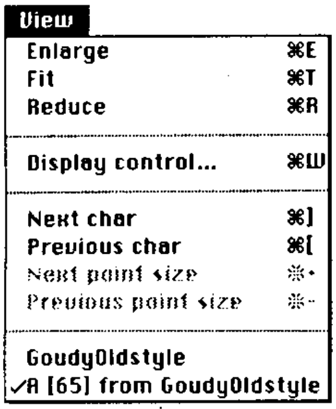
The "Weight" option allows you to change the thickness of this individual character's stroke from the default set in the "Font attributes..." dialog.

Cap and Join

The "Cap" and "Join" options are for stroked fonts. The "Cap" options determine the shape of the endpoints of a stroked path. The "Join" options determine the shape of joins along a path.

Clear kerning pairs

This option allows you to remove all kerning pairs from your font. You may wish to this before choosing "Import kerning..." for a font. As a precautionary measure, a warning message allows you to "Cancel" this option before Fontographer deletes all the kerning pairs.



Enlarge

This item enlarges the magnification of the character edit window or bitmap window.

Fit

This item fits the character into the character edit window by enlarging or reducing it to the size that fits in the window.

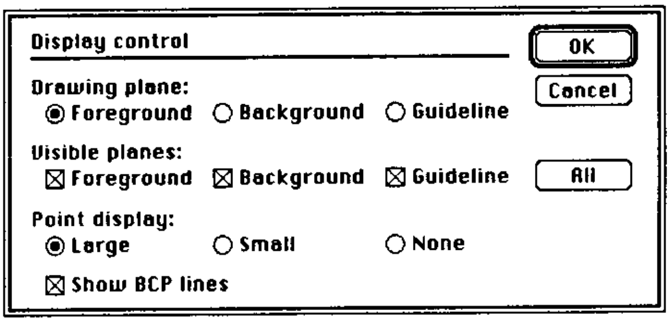
Reduce

This item reduces the magnification of the character edit window or bitmap window.

Display control...

This dialog allows you to control the edit window display.

Choose the active drawing plane by clicking in the "Foreground," "Background," or "Guideline" buttons. This is exactly equivalent to clicking in the plane indicator in the outline edit window's tool menu.


Display control

Drawing plane:
● Foreground ○ Background ○ Guideline

Visible planes:
☒ Foreground ☒ Background ☒ Guideline

Point display:
● Large ○ Small ○ None

☒ Show BCP lines

Choose which planes you want to be visible by checking the box next to them. Clicking in the "All" button will check all three check boxes.

You can have points displayed as "Large," "Small," or "None" (hidden) with the "Point display" options.

Checking the "Show BCP lines" checkbox will make the BCP lines visible. Unchecking the box will make them invisible.

Next char

This item switches the currently selected character to the next character in the ASCII font sequence.

Previous char

This item switches the currently selected character to the previous character in the ASCII font sequence.

Next point size

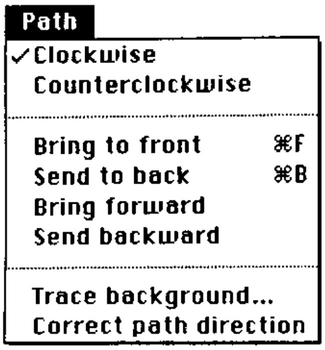
This item switches the size of the bitmap character in the bitmap edit window to the next larger point size.

Previous point size

This item switches the size of the bitmap character in the bitmap edit window to the next smaller point size.

Window list

A list of open windows will appear here. You can select any window and bring it to the front by selecting its name from this list.



Clockwise

This item will be checked if the selected path was drawn in a clockwise direction. You can change the direction of a path to clockwise by selecting this item.

Counterclockwise

This item will be checked if the selected path was drawn in a counterclockwise direction. You can change the direction of a path to counterclockwise by selecting this item.

Bring to front

This item brings a selected object all the way to the front.

Send to back

This item sends a selected object all the way to the back.

Bring forward

This item brings a selected object forward one layer.

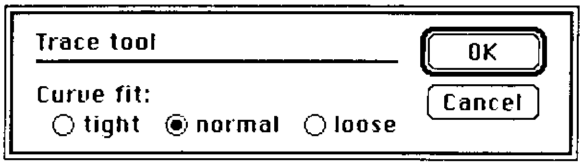
Send backward

This item sends a selected object back one layer.

Note: The last four items are only used in the context of composite characters (see Chapter Eleven).

Trace background...

The "Trace tool" will autotrace any PICT artwork or scanned image that you have pasted in the background layer or have brought in as a background composite from the "New composite" item in the File menu.



Trace tool

Curve fit:
○ tight ● normal ○ loose

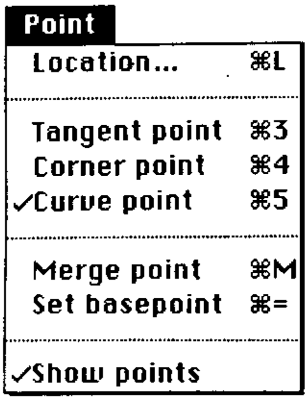
The "tight" button makes the trace follow every possible contour on the image. You will normally use this option only on very large size backgrounds (400-points or above), since the trace will try to fit the character very closely. This close fit may result in a large number of points.

The "normal" button is the default and is a good compromise between the "tight" and "loose" options. The "normal" button is generally the best all-purpose selection.

The "loose" button ignores little jagged edges and attempts to fit only the largest features of the background. You will normally use this option on smaller sized backgrounds (72- points and below) or low-resolution scans.

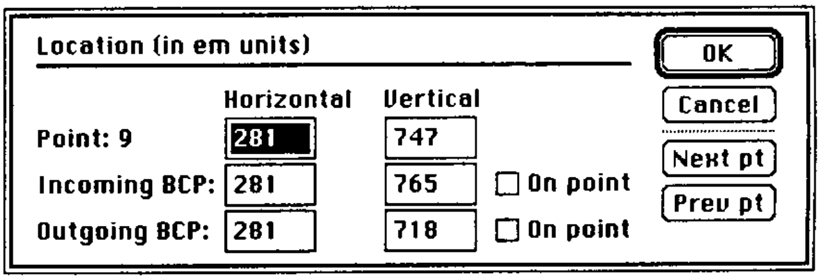
Correct path direction

"Correct path direction" examines all the selected characters and, if necessary, automatically reorders their path directions. Outer paths are set to clockwise, the inner paths to counterclockwise.



Location...

When you have selected a point, the "Location..." dialog allows you to place that point and its BCPs precisely. All units in the dialog are in em-square units, measured from the origin point. "Incoming BCP" and "Outgoing BCP" will be different depending on the direction of the path this point is on (clockwise or counterclockwise). If you click in the "On point" check box for either or both BCPs, Fontographer will move the BCPs so that their location is the same as the point's location.

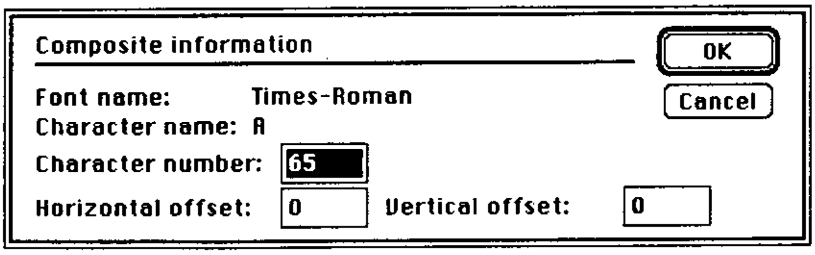


Location (in em units)

	Horizontal	Vertical	
Point: 9	281	747	
Incoming BCP:	281	765	☐ On point
Outgoing BCP:	281	718	☐ On point

You can choose "Next pt" and "Prev pt" to specify accurate point placement. When you use this option, Fontographer automatically selects the next or previous point in the path.

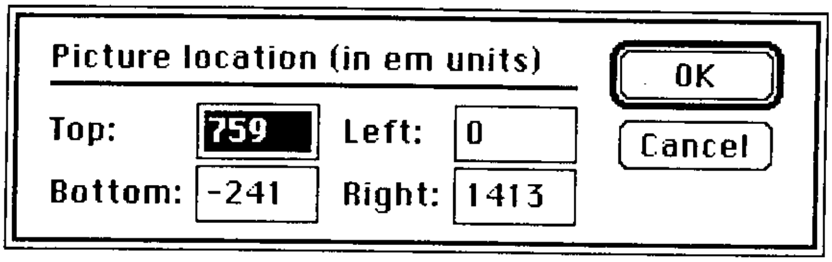
When you have selected the representation of a composite character, the "Location..." dialog gives you information about that composite character. The "Font name" tells you which font this composite character references. The "Character name" is the PostScript name for this character. The "Character number" can be changed so that it points to a different



Composite information

Font name: Times-Roman
Character name: A
Character number: 65
Horizontal offset: 0
Vertical offset: 0

character in the currently open font. The "Horizontal offset" and "Vertical offset" numbers are normally set to zero but you can adjust the placement of the composite character within the bounding box by changing these offsets, which are in em-units.



Picture location (in em units)

Top: 759

Left: 0

Bottom: -241

Right: 1413

When you have selected a background picture, the "Picture location" dialog gives you information about the picture that allows you to change its location in the background layer of the character edit window. Type in the location (in em-square units) you want the picture to move to. If you change only one of these numbers, your picture will be scaled. To merely move a picture up, you must add the same amount to both the "Top" and "Bottom" numbers; to move left or right you must change both "Left" and "Right" items by the same amount.

Tangent point

This item will be checked if the selected point is a tangent point. Selecting this item while points of other kinds are selected will change those points to tangent points.

Corner point

This item will be checked if the selected point is a corner point. Selecting this item while points of other kinds are selected will change those points to corner points.

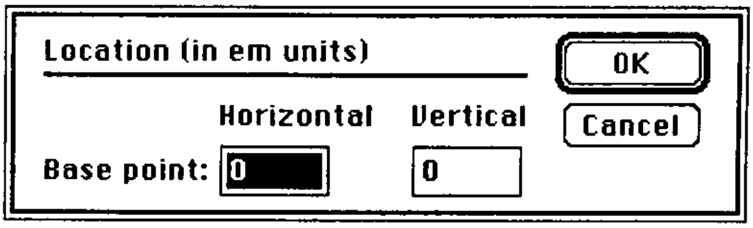
Curve point

This item will be checked if the selected point is a curve point. Selecting this item while other kinds of points are selected will change those points to curve points.

Merge point

Selecting this item will remove the selected point without breaking the path it is on. If you need to open a path, use the Delete (or Backspace) or Clear key.

Set basepoint



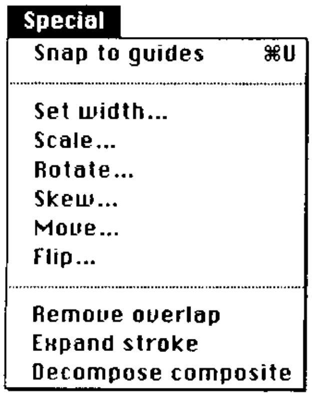
Location (in em units)

	Horizontal	Vertical
Base point:	0	0

If you have not selected any points, choosing this item will cause a dialog to appear which will allow you to set the horizontal and vertical location of the basepoint. If you've selected a single point, Fontographer will move the basepoint to that point. If you have selected more than one point, Fontographer will set the basepoint to the center of the selection.

Show points

If this item is checked, Fontographer will show the points on the path(s) in the character edit window. When this item is unchecked, Fontographer merely draws the outline(s) of the character and does not show the points.

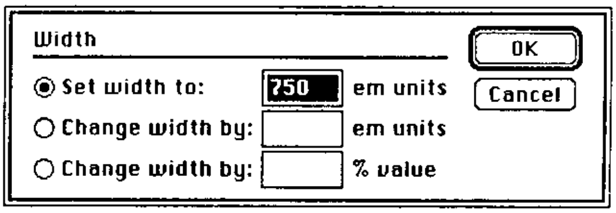


Snap to guides

If this item is checked, any point that you drag or any point that you add will snap to the closest defined guideline within three screen pixels of your mouse pointer.

Set width...

This dialog allows you to set the width of any selected character(s). If you are creating a monospaced font, select all the characters and set their width to some number of units. Fontographer will set them all at once.



Width

● Set width to: 750 em units

○ Change width by: em units

○ Change width by: % value

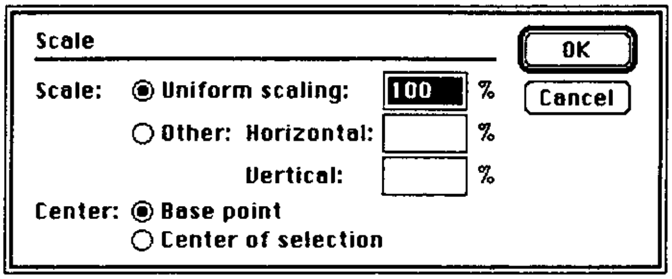
If the spacing of your characters is too tight or too loose you can use the "Change width by em-units" option to change the width of selected characters by a specified number of em-square units.

If you need to increase or decrease the width of selected characters by a specified percentage, you can do so with the "Change width by % value" option. Enter a percentage change value in the box.

Scale...

The "Scale..." dialog allows you to resize selected characters. 100% scaling means that Fontographer does not change the size of the character(s). If you wish to make selected characters smaller, use numbers below 100. If you wish to make them larger, use numbers over 100.

You can scale the horizontal and vertical dimensions separately if you wish. A 200% horizontal scaling coupled with 100% vertical scaling will make selected characters twice as wide while leaving them just as tall as they were before the scaling operation.



Scale

Scale: ● Uniform scaling: 100 %

○ Other: Horizontal: %

Vertical: %

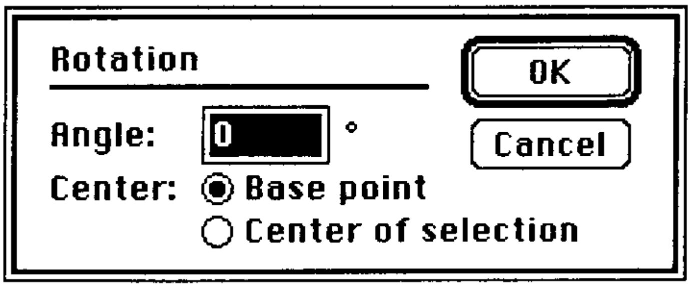
Center: ● Base point

○ Center of selection

The choice as to whether Fontographer will scale from the "Base point" or the "Center of selection" will be enabled only if you have a character edit window open and have selected some objects in that window. Normally you will allow Fontographer to default to scaling from the "Base point."

Rotate...

The "Rotate..." dialog allows you to rotate any character(s) or selected parts of a character. The rotation will normally occur relative to the "Base point," but you can rotate around the "Center of selection" if you have selected objects in the character edit window.



Rotation

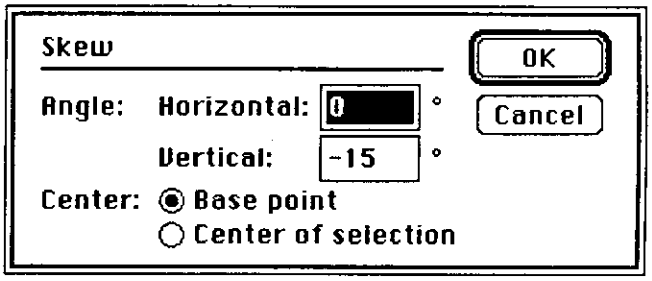
Angle: 0 °

Center: ● Base point

○ Center of selection

Skew...

The "Skew" dialog allows you to skew any character(s) or selected parts of a character. The skewing will normally occur relative to the "Base point," but you can skew around the "Center of selection" if you have selected objects in the character edit window. The default vertical skew of -15 degrees will skew a plain character into a reasonable facsimile of an italic character. Positive degrees of vertical skew bend the character to the left, negative degrees bend it to the right.



Skew

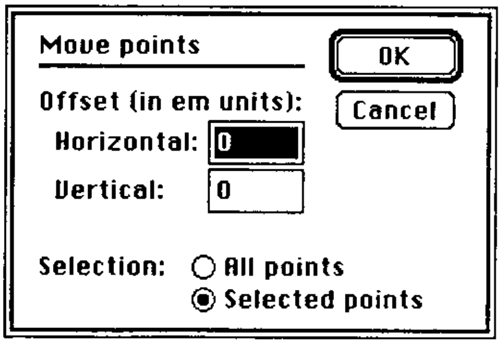
Angle: Horizontal: 0 °

Vertical: -15 °

Center: ● Base point
○ Center of selection

Move...

The "Move..." dialog allows you to move selected objects a specified distance horizontally, vertically, or both. If you have not selected any objects, the selection button will default to "All points."



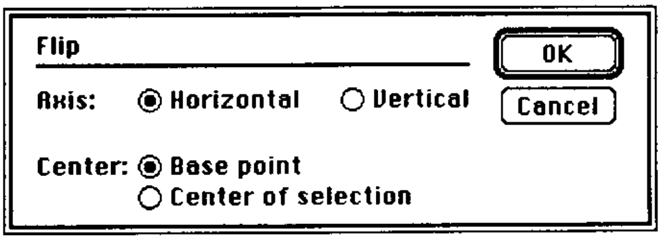
Move points

Offset (in em units):
Horizontal: 0
Vertical: 0

Selection: ○ All points
● Selected points

Flip...

The "Flip..." dialog allows you to flip any character(s) or selected parts of a character. The flip can be either horizontal or vertical and will normally occur relative to the "Base point," but you can flip around the "Center of selection" if you have selected objects in the character edit window.



Flip

Axis: ● Horizontal ○ Vertical

Center: ● Base point
○ Center of selection

Remove overlap

The "Remove overlap" dialog allows you to merge and remove overlapping areas. You'll get the best results if your path has a normal fill. If the path has an even/odd fill, you will be able to merge the paths, but you'll need to remove the overlapping segment(s) manually. Removing the overlap(s) may result in faster printing fonts and help the hinting process.

Expand stroke

The "Expand stroke" dialog is used to expand stroked characters (such as Courier) into contoured (outline) or filled characters.

Decompose composite

The "Decompose composite" dialog breaks a composite character into explicit paths. This is useful when building characters like the Lslash.

STRUMENTI

Tools...

Outline edit window tools

FRECCIA

Arrow

The *arrow tool* is for selecting and dragging objects. You can choose this tool by typing the number 1.

Pen

The *pen tool* is for drawing outlines or strokes without having to change tools. You can choose this tool by typing the number 2.

Tangent

The *tangent tool* is used to connect straight lines to curves for smooth joins. You can choose this tool by typing the number 3.

Corner

The *corner tool* connects two straight lines or two curves at a cusp. Both the incoming and outgoing paths can be adjusted with an independent BCP. You can choose this tool by typing the number 4.

Curve

The *curve tool* creates a point with curves on both sides. The angle of the curve can be adjusted from either of the incoming or outgoing BCPs and the radius of the curve can be adjusted individually by the BCP on the appropriate side of the point. You can choose this tool by typing the number 5.

Circle

The *circle tool* creates circles. You can choose this tool by typing the number 6.

Basepoint

The *basepoint tool* allows manual placement of the basepoint. You can choose this tool by typing the number 7.

Width

The *width tool* adjusts a character's width in any of Fontographer's planes. You can choose this tool by typing the number 8.

Bitmap edit window tools

Pencil

The *pencil tool* allows you to change the bits of a bitmap character in the bitmap edit window.

Other useful tools in the bitmap and character edit windows

Hand

The *hand tool* lets you move the display area—useful for large characters. To change from the pencil or selection tool to the hand tool, hold down the Space bar.

Magnifying glass

The *magnifying glass* appears when you zoom in or out on the character. To magnify or zoom in, type ⌘-Space and click.

To zoom out, type ⌘-Option-Space and click.

Special keys

Tool switches

To avoid having to constantly move the pointer back to the outline edit window's tool palette, you can use the number keys on your keyboard to switch between tools. When the lock icon is in the locked position, pressing the following numbers will get you the corresponding tool:

1	Pointer selection tool
2	Pen tool
3	Tangent point tool
4	Corner point tool
5	Curve point tool
6	Circle tool
7	Basepoint tool
8	Width tool

Arrows

In the font window the left and right arrow keys will move you to the previous character or to the next character (just like ⌘ [and ⌘]).

The up and down arrows select the character in the row above or below the present character.

Command keys

⌘

All the menus show the equivalent command key sequences. Here is a list of the main items with their Command key equivalents:

a	Select all	n	New font…
b	Send to back	o	Open font…
c	Copy	p	Print…
d	Duplicate	q	Quit
e	Enlarge	r	Reduce
f	Bring to front	s	Save
g	Get part	t	Fit
h	Open outline character	u	Snap to guides
i	Character info…	v	Paste
j	Open bitmap character	w	Display control…
k	Open metrics	x	Cut
l	Location…	y	Redo
m	Merge point	z	Undo

⌘-Space-click:	Enlarges magnification of edit window centered on pointer.
⌘-Option-Space-click:	Reduces magnification of edit window centered on pointer.
⌘-and a period:	Cancels time-intensive operations.

Option keys

Option double-click on a character in the font window to open the bitmap edit window.

When creating a new font, typing ⌘-Option-n creates a 512 character font.

When creating a new font, typing ⌘-Option-Shift-n creates a 1,024 character font

When pasting an EPS image, holding down the Option key when pasting will paste the image between the character's baseline and ascent.

Typed keystrokes in edit windows

If the lock icon in the bottom left corner of an edit window is open, any typed keystroke or sequence of keystrokes will change the character in the edit window to the keyed character. Clicking on the lock icon or pressing the Return or Enter keys will toggle the lock on and off.

Special keys in outline edit window

Press	**To get this action:**
⌘	Change the cursor into the selection tool.
Space	Change the cursor into the hand scroll tool.
⌘-Space-click	Zoom in.
⌘-Option-Space-click	Zoom out.

Press	**To get this action:**
⌘-Shift-t	Autotrace a background image.
Shift	Constrain movement of selected point(s) to horizontal or vertical straight lines.
Option f	Hide or bring the foreground plane into view when the lock icon is in the locked position.
Option b	Hide or bring the background plane into view when the lock icon is in the locked position.
Option g	Hide or bring guidelines plane into view when the lock icon is in the locked position.
Arrow keys	Move selected point(s) by one em-unit in direction of arrow.
Shift-arrow key	Move selected point(s) by ten em-units in the direction of the arrow.
Option	Allow dragging of BCP when it is on top of a single selected point.
Control	Demagnify a BCP's movement to single em-units.
Option-click-on width tool	Call up "Set widths" dialog.
Option-click	On most recently drawn curve point (by pen tool) retracts outgoing BCP making point a corner point.
Shift-Option	Constrains BCP movement to the slope of the corresponding path, while moving BCP with pointer tool.
Return or Enter key	Toggle the lock icon on and off.

Special keys in metrics window

Press	To get this action:
Left-right arrows	Change width of selected character by one em-unit.
Shift-left-right arrows	Change width of selected character by 10 em-units.
Option-left-right arrows	Change kerning pair value relative to character to the right of selected character by one em-unit.
Shift-Option-left-right arrows	Change kerning pair value relative to character to the right of selected character by 10 em-units.

Special keys in bitmap window

Press	To get this action:
⌘-Space-click	Zoom in on the bitmap character
⌘-Option-Space-click	Zoom out on the bitmap character.
Space bar	Switch the pencil to a hand tool.
Return or Enter	Toggle the lock icon on and off.

Chapter Fifteen

Fontographer Preferences

Fontographer Preferences is a file that contains information about the windows, including the size, position, and current character being edited in the window. Several other settings like the size of the points, the tracing parameters, and the lock setting are also saved. The preference file is very useful since it sets up your window configuration quickly when you open a font.

"Fontographer Preferences" is saved as a text file in the System Folder. When an existing font is opened, if the Preferences file is in the System Folder, your windows will open with the appropriate characters and windows in the same position they were in when the font was last saved.

Note: To disable the Preferences file, hold down the Option key when you select the "Open font" command from the File menu.

Hints

Fontographer can automatically place ***hints*** into your fonts to improve the quality of screen fonts and low-resolution printer fonts. These hints primarily control the stem weight of the font so all letters which should have uniform stems do. This eliminates the occasional problems where one side of a letter like "H" can print a single pixel wider than the other side at certain point sizes. Fontographer's PostScript hints improve the quality of the font in other subtle ways as well.

The basic technology behind these automatic hints comes from our licensing of Nimbus Q™ technology from The

Company, 400 World Trade Boulevard, Boston, MA 02210. Nimbus Q was chosen for its speed, quality, ease of adaptation, and growing acceptance by printer manufacturers. Features are extracted from characters using Nimbus Q feature recognition software. A combination of Nimbus Q and Altsys-developed software generates bitmaps for screen fonts. PostScript hints rely on Altsys technology that minimizes the speed degradation and increased size otherwise required to hint a PostScript font.

Optional Fontographer modules allow you to manually edit hints and Nimbus Q fonts. Contact Altsys for more information.

By knowing something about this hinting process, you can help it to improve the quality of your font, while reducing the size. Professional font designers making fonts for commercial distribution may wish to edit hints directly via the hint editing module, but for most people, the automatic hints are adequate and simple to control.

The first rule is that characters should *ALWAYS* be drawn with the outer perimeter going in a clockwise direction and successive inner perimeters reversing direction. If your characters are drawn counterclockwise, Fontographer hints the white space, not the black space. This may actually prove useful in certain circumstances (none we can imagine), where you want the white space of an "m", for example, to be equal on both sides of the central stroke, but don't care about the three vertical strokes being equal.

Note: The fill type is ignored when generating Type 1 fonts, which always use a "normal" fill. Therefore, setting the fill is only meaningful for Type 3 fonts and viewing your characters in the metrics window.

To improve print performance, no feature normalization is done for Type 3 fonts at print time. In other words, if the stroke of the "I" is 50 em-units wide, and the strokes of the "H" are 48 em-units wide, the stroke widths of these two letters may differ at print time for certain point sizes. Type 1 fonts with hints can perform this normalization at print time in newer versions of PostScript.

Only horizontal or vertical strokes are hinted. Fontographer is somewhat forgiving, and will actually recognize near-horizontal or vertical lines if they are within 5 of horizontal or vertical, but don't expect to see the angled strokes in a "K" maintain uniform widths.

Fontographer only hints curved strokes if there is a curve point with a tangent that is horizontal or vertical. So an "O" would be hinted if there were curve points at 12 o'clock, 3 o'clock, 6 o'clock, and 9 o'clock on both inner and outer perimeters. Placing points at other positions would result in no features being found and thus, no hints.

PostScript hinted font compression works best with a minimal number of discrete horizontal and vertical locations per character. You can make every serif different from every other serif in an "H," for example, but it will cost you to do so. If you create a symmetrical character by making corresponding points of the top and bottom serifs line up vertically in each stem, and corresponding points of the left and right stems and serifs line up horizontally, you will achieve the best compression of your character. It may not be as aesthetically pleasing at 1000 points, so this normalization is a decision Fontographer allows you to make for yourself on a character-by-character basis.

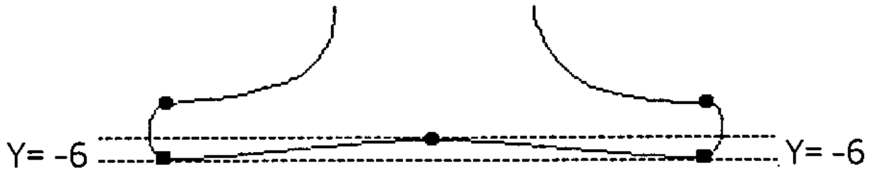
Flex

The purpose of Flex is to eliminate slight indentations in the font's outline at small sizes (if possible), while still keeping those same indentations at larger sizes. When the Flex box is checked, Fontographer applies subtle effects to cupped serifs and tapered stems. Garamond is a good example of a font that would need Flex to properly render its serifs. The Flex option is available only for Type 1 fonts.

A segment will only respond to Flex if it meets certain requirements:

- The segment must be comprised of exactly two Bézier curve segments, typically created by placing a corner point, a curve point, and a corner point.
- The outer points must be perfectly vertical or horizontal (meaning that they have the same X or Y coordinate).
- The difference between the end points' X/Y coordinates and the middle point (known as Flex height) must be 6 units or less in the Flex direction.

  Thus for a serif Flex, the middle point should be at Y=0 and the end points should be at or above Y=-6.



Note: Applying Flex to your font can add as much as 10K to the size of your font file.

Appendices

Fontographer Disk Contents

Fontographer's "Program" disk contains the following files:

- **Program:** This is the main program file.
- **ReadMe file:** If this exists, it is a TeachText file that contains important changes not in this guide.
- **TutorialFont:** This is a instructional font, to be used in conjunction with Fontographer's tutorial.
- **TutorFon:** The TutorialFont's Type 1 PostScript file.
- **TutorialFont.AFM:** The AFM file for TutorialFont.
- **TutorialFont.bmap:** The bitmap font for TutorialFont.
- **Scrapbook:** Special scrapbook for use with the Tutorial.
- **TeachText:** A utility to read text (ReadMe) files.
- **PSSample:** A standard PostScript sample file with text in several sizes.
- **LaserWriter Font Utility:** Apple's font downloading program.

Fontographer's "Tools & Utilities" disk contains the following files:

- **Font/DA Mover:** A utility to move fonts between files. The version provided here is the latest version Apple has released to developers. Check its "Get Info..." box for the version number. If you have a later version, use that one.
- **LaserWriter Font Utility:** Apple's font downloading program.
- **Sample fonts:**
  - **DemoFont:** A demonstration font developed by Casady & Greene, Inc.
  - **DemoFon:** The DemoFont's Type 1 PostScript file.
  - **DemoFont.AFM:** The AFM file for DemoFont.
  - **DemoFont.bmap:** The bitmap font for DemoFont.
  - **KeyStrokeArt:** A special composite font which contains several art examples.

- **KeyStroke Art.bmap:** The bitmap font for KeyStrokeArt.
- **SpecialSymbol:** A library font with special characters.
- **SpecialSymbol.bmap:** The bitmap font for SpecialSymbol.
- **GraphicLite:** A demonstration font developed by Richard Mitchell.
- **About Graphic Lite:** Special information about the Graphic Lite file.

PostScript Sample Files:
- **PSSample:** A standard sample file with text in several sizes.
- **PSKernPairs:** A file with some standard kerning pairs.

Tips

We'd like to pass along several tricks we've learned while using Fontographer. Some of these are just reminders, others are shortcuts to solving typical problems. If you have additions, please send them to us.

- Images that are pasted into the background layer are automatically sized to fit the em-square. To maintain the original size of the "PICT" when pasting into the background layer, hold down the Option key and use the "Paste" command.

- When pasting an EPS image into the character edit window, holding down the Option key when pasting will paste the image between the character's baseline and ascent. Pasting without holding down the Option key will scale the outline to fit between the descent line and the ascent.

- When you are in the font window, pressing the Return or Enter keys opens the character edit window for the first character you selected.

- You can create a 512 character font by holding down the Option key when you choose "New font..." from the File menu.

- You can create a 1,024 character font by holding down the Shift and Option keys when you choose "New font..." from the File menu.

  Note: You can not print samples of fonts with 512 or 1,024 characters. However, you can print individual character samples from the character edit window.

- Minimize the total number of points while drawing characters. Smaller characters draw faster, take up less space in the printer and on your disk, and usually generate smoother characters. Learn to adjust the Bézier Control Points to get the most from each curve.

- Open a line by inserting a point, then clearing it. This works well for opening a sans serif character so a serif foot can be glued onto it. Insert the point in the middle of the horizontal cross stroke in its foot, then clear it. You just opened up the foot, and can now glue a serif foot onto the open piece.

- Use the Option key to force BCPs to be selected before curve, tangent, or corner points.

- Move one or both BCPs on top of their curve points to get sharp corners with slope control.

- Pre-build templates for Times-Roman, Helvetica, Symbol, and any other PostScript fonts you regularly use as templates. Then, instead of opening a template each time you need a template character, just open the pre-built template and "Copy" the character(s) you need. Attaching a library to a font is a good way to store these templates.

- Fontographer supports background tasking for Tracing, Bitmap generation and PostScript generation. You can use another application and perform other tasks while these tasks are being performed.

- Use the first 32 characters as a parts library for cut and paste or composites. Except for character 9 (tab) and character 13 (carriage return), they cannot be typed from the Macintosh keyboard, so might as well be used for something useful. The last four characters can also be used as a library. If you need even more storage space, attach a library to your font.

- To disable the "Preferences" file, hold down the Option key when opening the font.

- You can regenerate a Type 1 font's bitmaps without destroying any of your nicely edited bitmaps. Simply select the Space character (Decimal character 32) in the font window, then "Generate fonts..." with the "Selected characters" button on. Remember, you must generate bitmaps when changing from a Type 3 to a Type 1 font.

- If you are generating Type 3 fonts for a program that does not support hinting, you can turn hinting off before you generate your PostScript font. To render the best screen fonts, however, it is a good idea to first generate your bitmaps with hinting "on." Then you can turn hinting "off" before generating your PostScript font file.

- The "Adobe® standard encoding" vector should only be used if you are generating fonts for a non-Macintosh system. If you create fonts with this encoding vector for the Macintosh, you must "Copy" and "Paste" the Symbol character (from the Symbol font) into the appropriate positions. If you don't do this, you will have serious and uncorrectable spacing problems any time you use those Symbol characters.

- Fontographer 3.1 has vertical "zones" that are important for uniformity in the font. If letters fall into these zones, the font will have uniform height. If not, your characters could vary in height. Some guidelines to keep in mind:

  Capital letters' top coordinates should be between the top of the "H" and the "O."

  Lowercase letters' top coordinates should be between the top of the "x" and the "p." Bottoms of letters should be between the baseline and the bottom of the "O."

  All characters' tops and bottoms will be automatically aligned if they fall into these zones.

  Technically, the "O" and the "o" (and other curvy letters) are said to overshoot the "H" and the "x" by about 4%, which makes them appear to be the same size as straight letters. We take advantage of Type 1 fonts' ability to align tops and bottoms vertically within these overshoot zones, but only if the font is drawn according to the above rules.

B

Troubleshooting

Here are some common questions asked of our technical support department. All the information in this section is presented in the manual, but you might look here for quick help.

How can I find which keystroke produces the special character I created without starting up Fontographer?

Almost all Macintosh computers have the desk accessory called Key Caps installed in their Systems. Select the Key Caps desk accessory; then use the Key Caps menu (which appears in your menu bar) to select your font. Type the desired keystroke.

Why are the inner parts of my letters filling with black instead of white?

Because PostScript's rules for filling closed paths require either that enclosed paths have a different direction from enclosing paths or that PostScript's filling rule be changed to even/odd. You can either change the direction of your enclosed paths with the Path menu's "Clockwise" or "Counterclockwise" items or you can use the Edit menu's "Char info..." dialog to change the filling rule PostScript will use from "Normal" to "Even/odd." If you want your font to hint properly, you should always leave the fill set to "Normal."

How can I create white characters on a black background?

See the example that starts on page 5 of Chapter Eleven.

Why don't the characters I've created in the control characters' (Decimal 0-31) positions work in my word processing program?

Some word processing programs filter out control characters. You should place your characters in some other character slots. Characters placed in these control character slots will not be accessible from a non-ADB keyboard (such as the Macintosh Plus keyboard).

Why doesn't my installed font show up in the font menu of my program?

Make sure you have installed your fonts as per the instructions in Chapter 5. Reinstall if necessary. Check to make sure your program recognizes NFNTs. Certain versions of programs (for instance, PageMaker 3.0), do not recognize the new NFNTs. However, PageMaker 3.01 and above does recognize NFNTs. If you're using Microsoft Word version 3.x, see your Microsoft Word manual for information on the special font installation process required by Microsoft Word 3.x.

Why does my composite font print with unsightly overstrikes when I attempt to Bold it?

Composite fonts based on plain style original fonts will look overstriked when you apply the Bold attribute to them. The way to solve this is to create a composite of the Bold version of the original font and then choose it from font menu when you need a Bold version of your composite font. You can acquire complete sets of styled screen fonts for all of Adobe's fonts from CompuServe's Adobe Forum (GO ADOBE, Download Library 6—Typefaces/MAC). Altsys' Family Builder can build sets of styled composites into a family, so styles can be chosen from a Style menu or dialog rather than the Font menu.

Why do my composite fonts print in Courier instead of the original font my composite was based on?

Always make certain that the original font has been downloaded into the printer before using your composite font. Composite fonts do not stand alone; they require that the PostScript of the original font be in the printer at the time of printing. Many programs will allow you to do this automatically if you simply place a space character in the original font just preceding any text in the composite. The space in the original font will cause the printer driver to download the original into the printer, thus allowing your composite font to reference it. If the "space method" doesn't work, you must download the original font into the printer with the LaserWriter Font Utility (on Fontographer's "Tools & Utilities" disk). You must do this download especially when attempting to print samples of your composite font from Fontographer.

If your composite font is based on one of the fonts built into your PostScript printer (for example, Times, Helvetica, Courier, and Symbol are almost always built into your printer) you do not need to download this font. Your composite font will reference the built-in font.

After installing your composite font, the print drivers automatically download the font to the printer (when required). You don't need to download the composite font manually.

I want to create a composite font but the original doesn't show up in the "Select template font" dialog. Why?

To create or edit a composite font, the original font's bitmaps must have been installed in your System file or made available to the System with Suitcase, Font/DA Juggler or MasterJuggler.

Why do the images I'm pasting into Fontographer's background layer seem to change size from character to character? I want all the characters a uniform size, so how do I make this happen?

If you're attempting to take a scanned font and place it into Fontographer for tracing, you need to know the following: Fontographer automatically resizes the scanned images you "Paste" into its background layer in order to fit them into the bounding box of the character you paste them into. If the images you paste in are of different sizes, your characters will be resized differently, which is bad since one of the characteristics of a good font is that all the letters adhere to a standard ascent, descent, and x-height. There are two ways around this problem: the first is to hold down the Option key when pasting, which will bypass Fontographer's automatic resize. You can then scale the bitmap exactly the same amount for each character using the Special menu's "Scale..." item. The second method is to make sure you cut each character from the scan using the exact same size bounding box for each character. This means you will have to determine the height and width of your tallest and widest characters (including the distance from the top of the tallest character to the bottom of the lowest descender) and use that height and width as the rectangle for cutting out all your characters. If you deviate from that rectangle, your characters will not be consistently resized in Fontographer. Any "paint" type program can be used to accomplish this: just draw a rectangle of the proper size, "Paste" the character into that rectangle, then use the marquee selection tool to select the interior of the rectangle and finally "Copy" the selected area to the clipboard. From the clipboard you can "Paste" the result into the Scrapbook or into Fontographer itself.

How can I download my font to the hard disk attached to my printer?

Use the LaserWriter Font Utility on Fontographer's "Tools & Utilities" disk to download your font to your printer's hard disk. Present versions of Adobe's Font Download utility do not support the downloading of Fontographer Type 3 fonts. Avoid using this utility to download anything other than Type 1 fonts. It may appear to download the Type 3 fonts, but you will not get the desired results. The LaserWriter Font Utility will download fonts to the hard disk of most PostScript printers. If the LaserWriter Font Utility can't download the font to the hard disk, use the download utility that is included with your printer or consult your printer vendor.

Why does my font change to something completely unexpected when I move a document created on my computer to some other computer?

Assuming that you have correctly installed your font on both computers, the reason this can happen is that some programs refer to fonts by number rather than by name. When you install a new font into a System, the Font/DA Mover can (if the System already contains a font with the same number) renumber the font you're installing without telling you that it has done this renumbering. Programs that refer to fonts by number will then think they should use the font that has the same number as your font (the font that caused the renumbering of your font) rather than your (now renumbered) font. If this seems confusing, you should probably use programs like Aldus FreeHand or Aldus PageMaker which refer to their fonts by name rather than number. Check with the vendor of your program to make sure it refers to fonts by name in order to avoid this problem.

Why does my font print jagged looking bitmapped characters instead of the smooth ones I expected of PostScript?

If your printer does have PostScript and you are still getting bitmapped results, the probable cause is that you have not installed the PostScript font file into your System Folder. Simply drop the PostScript font file into your System Folder and try again.

If installing the PostScript file still doesn't make things work, you have probably tried to change the name of your font without completely regenerating the PostScript and bitmap files. If you change the name of your font, do not attempt to rename the files Fontographer creates by retyping their names in the Finder. Use Fontographer's "Save as..." item from the File menu to save your font under a new name. Then use the File menu's "Generate fonts..." item to regenerate the PostScript font files.

If your printer doesn't contain PostScript (for example, an ImageWriter or a LaserWriter IISC) you may get results that look bitmapped. One solution is to generate bitmap sizes appropriate for your printer (for example 3X sizes for an ImageWriter LQ) and then restrict your printing to only those sizes that have the appropriate multiple size installed.

How can I change the spacing of my font without affecting all the nicely edited bitmaps I have worked on for so long?

To regenerate all spacing information in a font, select only the space character (#32 decimal) just prior to using the "Generate fonts..." item in the File menu. Be sure to click in the "Selected characters" button in the "Generate fonts..." dialog.

Why does my printer give me a PostScript error when I use my font?

If you are already using several downloadable fonts, loading one more font into your printer can exceed its available memory capacity. For example, most LaserWriters cannot handle more than three downloadable fonts at once. If you get a PostScript error when using your font, try turning off your printer for a minute and then turning it back on. If this does not solve the problem, you may have to simplify your document by reducing the number of downloadable fonts you use. On the other hand, there are programs like Aldus FreeHand 2.0 or PageMaker that can utilize an unlimited number of downloadable fonts. Using this kind of program could solve this problem.

Large fonts may fill up the memory of the printer, and cause printing errors. Depending on the memory in your printer, the size of the font it will print varies. Fonts larger than 150K have problems printing on the LaserWriter (1Mb RAM). Typically, fonts created with Fontographer are 50 to 60K. If you run into this problem, make sure you do not have unnecessary points and characters in your font.

Why don't my bitmap fonts show up in Font/DA Mover?

You must use Font/DA Mover version 3.8 or above with Fontographer fonts. Earlier versions of Font/DA Mover do not show the new "NFNT" type fonts that Fontographer creates. The Font/DA Mover on Fontographer's "Tools & Utilities" disk is a version appropriate for installing Fontographer bitmap fonts.

How can I use my Fontographer fonts on some other kind of computer?

Altsys has placed information on the subject of porting fonts to computers other than the Macintosh in a file you can download from CompuServe. It is in the APVENB forum's DL3 (Altsys' data library); its name is IBMTEK.MCW. There is a text file version of the same information under the name IBMTEK.TXT which you should use only if you do not have MacWrite.

Why does my monospaced (non-proportional) font show up with strange spacing problems in some programs but not others?

Monospaced fonts (like Courier or a composite thereof) are a special case that sometimes require a change to the Flag word in the FOND resource. You will need ResEdit to make this change. Open the appropriately named FOND resource in the font file and change the Flag word (the very first thing at the top of the FOND) from $0800 or $0000 to $C000 (just select the whole thing and type the new stuff over it). Apple has declared this change null and void for System software and has recommended that all developers ignore this flag from now on, but many programs still look at this flag. Changing it shouldn't hurt—especially if you have had problems with spacing a monospaced font properly.

Even after I've downloaded my PostScript font, my changes are not reflected in my printed output. Why is this?

If you have assigned unique PostScript IDs to a font (in the "Generate fonts" dialog's "Outline ID" item), the rendered bitmap images of your characters are cached in the printer so that they do not need to be rasterized every time they are used. These bitmaps are referenced by the unique ID once they have been cached; however, the original cached bitmap will override your new font and re-downloading does not get rid of the old cached bitmaps. You need to use Adobe's Font Downloader 4.0 to remove the original cached bitmaps first, then download and print your changed font.

Sometimes "Remove overlap" doesn't seem to work properly. Why?

Since this is such a complex procedure, there could be different reasons why you can't remove overlaps:

Removing overlaps from self-intersecting paths will not work if your character is made up of one path. Fontographer will only remove overlaps from two or more separate paths. You will have to manually edit your characters in these circumstances.

"Remove overlap" will not remove the overlap in situations where two figures abut one another and points from one path lie on top of points from the other path. To fix this, move the points from one path slightly away from the other path, and then choose "Remove overlap."

"Remove overlap" works best on characters where the path directions are correct. Use the "Correct path direction" item from the Path menu to make sure that paths are going in the proper direction.

"Remove overlap" will not remove the overlap if there are very complex paths or too many paths in a character. Select paths in pairs and remove overlaps for just those pairs. Or break the character into simpler parts, placing them in unused characters elsewhere in your font, then bring the parts back together with the "Get part" command.

Symbol characters keep popping up in odd places in my font. I don't want this, so what should I do?

Turn off the "Adobe® standard character encoding" check box in the "Font attributes" dialog. This will prevent any odd characters from being substituted into your font. After doing this, you will have to regenerate BOTH the bitmap and the PostScript file and reinstall both of them. If you have designed a font in some previous version of Fontographer and have used most of the last 128 characters in the font, you should never check the "Adobe® standard character encoding" check box.

Some of the characters in my font appear bolder than others. Why is this?

Characters with path directions that are incorrect will appear bolder than other characters in the font. Make sure your characters all have the proper path directions. The outermost path of a character should be drawn Clockwise, while alternating inner paths should be Counterclockwise, Clockwise, etc. The Path menu's "Correct path direction" item will assure you that the paths for any open (or selected) character will be drawn in the proper directions. After correcting the path directions of any characters, you must regenerate both bitmaps and PostScript. The bitmap will then appear less bold and the PostScript will then print properly.

I seem to be having printing problems with my 1MB Mac plus. I'm using LaserWriter driver 6.0.

We recommend that you do not use LaserWriter version 6.0 with a 1MB Mac Plus. Use the system configuration Apple recommends (i.e., System version 4.2).

The Altsys Product Line

Metamorphosis Professional

Metamorphosis Professional is a type conversion utility which creates editable outlines and other computer font formats from PostScript language and TrueType fonts.

With Meta Pro, Macintosh users can convert their PostScript and TrueType typefaces into PICT outlines, EPS outlines, automatically hinted TrueType fonts (for Macintosh & PC-Windows), Type 1 PostScript (Macintosh, PC-Windows, and NeXT™) fonts, Type 3 PostScript (Macintosh & PC-Windows) fonts, and Fontographer database files.

EPS Exchange

EPS Exchange is the first software utility for the Apple Macinotsh which allows Aldus FreeHand® 3.0 drawings to be easily and accurately exported for use in Adobe Illustrator 88™ and Adobe Illustrator® 3.0.

The first in the Altsys XTRAS line of software, EPS Exchange provides a powerful design and productivity tool for art directors, freelancers, service bureaus, ad agencies, and other creative types who create illustrations with PostScript language drawing programs.

EPS Exchange is simple to use: choose "Save as…" or "Export" from the Aldus FreeHand File menu and then select either the Adobe Illustrator 3.0 or Adobe Illustrator 88 format. EPS Exchange automatically converts the Aldus FreeHand document to an Adobe Illustrator document.

With EPS Exchange, you can immediately begin to increase your flexibility in creating PostScript illustrations, as well as your ability to collaborate with your colleagues.

Fontastic Plus

Fontastic Plus is Altsys' specialized bitmap font editor designed to create new bitmap fonts and typefaces and customize exisiting bitmap character sets with distinctive characters, logos, and graphics.

Using MacPaint-like tools, you can easily create bitmap logos, foreign characters, clip art, and custom fonts. Images can be cut and pasted into a font from other applications (i.e., MacPaint). You can apply special effects like scaling (up to 127-points), as well as rotating, styling, and editing to provide a quick and easy way to design attractive fonts and graphics.

An integrated font mover makes installing your fonts as simple as cut and paste.

Fontastic Plus includes standard Altsys features such as kerning pairs and fractional character widths and allows for high quality printing on QuickDraw printers.

Style Merger

Style Merger takes styled fonts and merges them into one font family. This utility will work with both PostScript and TrueType fonts, and it never affects any fonts or font files on your computer; it simply reads existing fonts and creates new files.

Style Merger allows you to quickly and easily build a family containing Plain, Bold, Italic, and BoldItalic fonts and merge the four separate fonts into one family, thus saving space in your font menu.

Aldus FreeHand

Aldus FreeHand, designed and written by Altsys Corporation, is a powerful, precise, and easy-to use PostScript illustration and design tool for the Apple Macintosh. Like all Altsys products, Aldus FreeHand can meet the demands of commercial artists and designers, yet is simple enough for the average user. Aldus FreeHand is published by Aldus Corporation. Contact Aldus at (206) 622-5500.

A Short Bibliography of Typography and Allied Subjects

by David S. Rose

Fontographer gives you the ability to create new digital typefaces from your imagination, to recreate classic faces that are otherwise unavailable in digital form, and to adapt existing faces for your particular needs. As with any powerful tool, the more you know of the history behind it, the better able you will be to utilize it. These books are just a few of the hundreds that have been written on the subject of typography, but they will provide an excellent start for background reading in this area.

While many of the works listed are classics in the field, not all of them are currently in print. Those that are not available from the publisher (or from reprint houses such as Dover Publications) are generally available at most large libraries, and may usually be found at antiquarian dealers who specialize in the field of Books about Books. A number of such dealers are listed at the end of this bibliography.

Overviews of Printing Types

Printing Types: An Introduction by Alexander Lawson [Boston: Beacon Press, 1971] is a short (120 pages) easy-to-read overview that is exactly as advertised: an introduction. For over thirty years, Lawson has taught a course in the history of printing types at the Rochester Institute of Technology School of Printing, and this book grew out of his need for a simple handbook on the subject for his students. It is a well designed and illustrated inexpensive paperback, and would probably be your best bet if you have a casual interest in the subject and only want to read one book.

Letters of Credit: A View of Type Design by Walter Tracy [Boston: David Godine, 1986. 224 p. ill.] A beautiful and profusely illustrated step-by-step demonstration of type-design aesthetics that traces the beginnings and the path of modern-day typesetting.

Printing Types: Their History, Forms, and Use by Daniel Berkeley Updike (1860-1941) [New York: Dover, 1980 reprint of the second (1937) edition]. This is the classic work in the field of typographic history. Updike was a leader in the revival of traditional printing typefaces in the United States, and was the founder of the Merrymount Press (1893). A series of lectures he gave at Harvard from 1910-1917 served as the basis for Printing Types, which was first published in 1922. This Dover reprint is in two volumes, 618 pages of text plus 300 unnumbered picture pages. As Dover says in the jacket notes, "Printing Types presents the standards, the landmarks in typography that anyone connected with printing must know. In its mammoth, illustrated coverage, it is without a doubt the definitive guide to the subject."

Type and Typefaces by J. Ben Lieberman [New Rochelle: The Myriade Press, 1978] is an alternative to the Lawson book, but much less accurate, bigger (142 pages, 8 1/2 x 11, hardcover) and harder to find. Lieberman was an enthusiastic amateur printer, and this book is an exuberant look at the history, classification, identification, and personalities of typography. It includes examples of over 1,000 type faces, and is well illustrated. Lieberman was not a scholar, but if you like unabashed 'boosterism,' you might find this book fun to read, despite its errors of both omission and commission.

Fine print on type; the best of Fine print magazine on type and typography by Charles A. Bigelow, Paul Hayden Duensing, Linnea Gentry [San Francisco: Fine Print: Bedford Arts, 1988] is an excellent selection of articles from *Fine Print* magazine, the one indispensable periodical that anyone concerned with type should subscribe to. Each issue is designed by a different typographer, and is printed by letterpress. In addition to scholarly articles, typographic overviews, reviews, and notices of new books on typography, a supplement included with each issue contains a complete quarterly calendar of everything of typographic interest that is happening nationally and internationally. *Fine Print* is published quarterly, and subscription requests ($49) should be sent to 665 Third Street, Suite 280, San Francisco, CA 94107. Telephone (415) 543-4455.

Typographical periodicals between the wars; a critique of the Fleuron, Signature, and Typography by Grant Shipcott [Oxford: Oxford Polytechnic Press, 1980. xiv, 111 p. :ill.]. These classic periodicals (particularly the Fleuron) were to their time what *Fine Print* is to typography today, but because of the ferment in the world of design during the 20s and 30s, and because of their illustrious contributors, they had a much greater effect on the typography of the time.

History and Development of Lettering and Letter forms

Letters by James Hutchinson [New York: Van Nostrand Reinhold, 1983]. A stylishly designed, very readable history of alphabets, writing, and printing types.

The 26 Letters by Oscar Ogg [New York: Thomas Y. Crowell, 1948]. A nicely done book by a well known American calligrapher, tracing the evolution of the alphabet from prehistoric times to the invention of printing. 250 pages, well illustrated.

The History and Technique of Lettering by Alexander Nesbitt [New York: Dover Publications, 1957]. A thorough history of type design from its origin through the mid-twentieth century, this book covers some of the same material as the Ogg book, but includes much more information on the development of letter forms since the invention of printing. It is written from an artist's perspective, and has a how-to section on lettering.

The Alphabet and Elements of Lettering by Frederic W. Goudy [New York: Dover Publications, 1963. Reprint of 1952 University of California edition]. This falls somewhere between the Ogg and Nesbitt books, from Goudy's unique perspective.

Roman Lettering by L.C. Evetts [New York: Taplinger, 1979] includes a character-by-character analysis of the letters on Trajans Column in Rome, which have served for centuries as one of the foundations of roman letter design. Evetts also includes charts showing the evolution of the roman alphabet through the centuries. Handsome lettering, with little text to clutter the presentation.

An ABC Book: ABC of Lettering and Printing Types by Erik Lindegren [New York: Pentalic, nd ca. 1976]. A survey of type, calligraphy, and design, with examples of work from all periods, with an especially strong representation of lettering by Swedish, English, German, and American scribes and designers. A lively, well-designed introduction to letters.

Writing, Illuminating and Lettering by Edward Johnson [New York: Taplinger, 1980]. The comprehensive calligraphy manual by the man who led the twentieth century revival of calligraphy. Johnson's influence on English, American and German lettering and design was immense.

History of Lettering by Nicolete Gray [Boston: David Godine, 1987. 256 p].

Type Designs from Various Periods

Art of the printed book, 1455-1955; masterpieces of typography through five centuries from the collections of the Pierpont Morgan Library, New York by Joseph Blumenthal, (1897-) [New York: Pierpont Morgan Library; 1984. Boston, MA: D.R. Godine, xiv, 192 p. : ill.]. Available both in hardcover and paperback, this collection by one of the great printer/scholars of the century is a must have for anyone interested in original source material. More than a hundred full pages facsimiles from the Morgan Library provide an instant overview of the development of typographic design from Gutenberg to the the mid-twentieth century.

Selected Essays on Books and Printing by A. F. Johnson [Amsterdam: Van Gendt, 1970]. Johnson was a scholar at the British Museum, and along with Daniel Berkeley Updike and Stanley Morrison was considered one of the experts in the field of typographic history. This lovely, massive (500 pages), and very expensive collection of some of his writings from 1927-1957 concentrates primarily on the typographic work of sixteenth century calligraphers and printers.

A view of early typography up to about 1600 by Harry Carter [(The Lyell lectures 1968) Oxford, Clarendon P., 1969. xii, 137 p. 45 plates. illus., facsims., col. map].

A history of the old English letter foundries; with notes, historical and bibliographical, on the rise and fall of English typography by Talbot Baines Reed, 1852-1893 and A. F. Johnson [Folkestone: Dawsons, Reissued 1974 xiv, 400 p., fold. leaf : ill., facsims].

Notes on a Century of Typography at the University Press, Oxford, 1693-1794 by Horace Hart [Oxford, Clarendon Press, Reissued 1970 (1st ed. of 1900 reprinted) with an introduction and additional notes by Harry Carter.ix, 16, xvi, 203 p., plate. illus. facsims]. History of the types and typography of the Oxford University Press, generally regarded as the preeminent scholarly press in the western world.

Nineteenth Century Ornamented Type Faces by Nicolete Gray [Berkeley: University of California Press, 1976]. Reprint of a classic from 1938, this large format 240 page work is the definitive book on its subject.

American Wood Type, 1828-1900 by Rob Roy Kelly [New York: Da Capo Press]. Notes on the evolution of decorated and large wood types, and comments on related trades. As with the Nicolete Gray book, this is the definitive work in its field. The book was issued in several editions, of which this (paperback) is the least expensive.

The Typographic Book 1450-1935 by Stanley Morrison and Kenneth Day [Chicago: University of Chicago Press, 1963]. A lush, expensive, visual treasury of almost 500 years of typography, including 357 plates.

American typography today by Rob Carter [(New York: Van Nostrand Reinhold, 1989. 159 p. : ill. (some col.)].

The Liberated Page Edited by Herbert Spencer [San Francisco: Bedford Arts, 1987]. An anthology of the major typographic experiments of the 20th century, as recorded in *Typographica* magazine.

Typography

The Crystal Goblet; sixteen essays on typography by Beatrice Warde [Cleveland and New York: World Publishing Company, 1956]. From a major woman in the field of typography come some thought-provoking pieces, including the famous analogy that gave the collection its name. Out of print, but available, and mandatory reading.

Better Type by Betty Binns [New York: Watson-Guptill, 1989. 192 p]. An excellent new book that shows by copious examples the subtle differences in relationships between typefaces, letters, and spaces. From the preface: "This book systematically trains designers to make these fine discriminations, with the aim of specifying text type that is not only readable, but also beautiful and expressive." Highly recommended.

Introduction to Typography by Oliver Simon [London: Faber & Faber, 1945]. Not a bad place to start. This edition is out of print, but there has been at least one reprint in recent years. Simon's introduction is designed for the layman, and discusses many of the basic principles and theories of designing with type.

First Principles of Typography by Stanley Morrison [Cambridge: at the University Press, 1951]. An important book from the man who designed Times Roman for the *London Times*.

Asymmetric typography by Jan Tschichold [(Translated by Ruari McLean) New York, Reinhold Pub. Corp. 1967. 94 p. illus. (part col.) facsims]. Jan Tschichold (1902-1974), a well-known typographer, caused many people to rethink 'conventional' theories of typography when this seminal work was published in the mid-60s. Whether or not you agree with his approach, this book is required reading and will widen your typographic horizons.

An essay on typography by Eric Gill [1st U.S. ed. Boston: D.R. Godine, 1988]. A classic typographic manifesto on the art and craft of letterforms from the designer of Gill Sans and the famous typography of London Underground.

Typography, A Manual of Design by Emil Ruder [Niederteufen, Switzerland: Arthur Niggli Ltd. 1977. 3rd Edition]. A fascinating, disciplined, and very Swiss analysis of typography and letterforms. Ruder's discussion and illustration of the importance of white space in letter forms and graphic designs is excellent background reading.

Report on the typography of the Cambridge University Press by Bruce Rogers [Cambridge, Cambridgeshire: University Printer, 1950. viii, 32, (3) p. : ill.]. Bruce Rogers (1870-1957) is regarded by many as having been the greatest typographer and book designer of the twentieth century. After World War II he was commissioned by the *Cambridge University Press* to undertake a thorough review of all of the *Press'* publications and standards. The resulting *Report* had a major impact not only on the C.U.P., but also on the general typographic theory and practice in both Britain and the U.S.

Designing with type; a basic course in typography by James Craig and Susan E. Meyer [Rev. ed. New York: Watson-Guptill Publications, 1980. 176 p]. A modern 'how-to' book, available at many large bookstores and graphic arts dealers.

Type Designers

Twentieth Century Type Designers by Sebastian Carter [New York: Taplinger Publishing Company, 1987]. An excellent look at the people behind the type faces, with in-depth profiles of designers such as Goudy, Morrison, Zapf, etc.

Typologia; studies in type design & type making, with comments on the invention of typography, the first types, legibility, and fine printing by Frederic W. Goudy (1865-1947). [Reissued 1977. Berkeley: University of California Press, xviii, 170 p.: ill.; 24 cm.]. Written by the most prolific type designer of the 20th century [creator of, among others, the eponymous Goudy Oldstyle], this reprint of the 1940 edition discusses the history, function, and meaning of type, and gives some very good insights into how a type designer works.

Jan Tschichold: typographer by Ruari McLean [Boston: David R. Godine, 1975]. This puts Tschichold's career and writings in the context of developments in society around him. It is informative and throught-provoking on its own, and serves as useful background to his writings on the subject.

Manuale Typographicum; 100 typographical arrangements with considerations about types, typography and the art of printing selected from past and present, printed in eighteen languages by Herman Zapf [Frankfurt, New York: Z-Presse, 1968]. Herman Zapf is known to most desktop typographers primarily for giving his name to the Zapf Dingbat font. He is, in addition, one of the most respected and creative typographers and type designers of the century, who created not only the Dingbat and Zapf Chancery fonts, but also Optima, Lydian, and many other faces. Manuale Typographicum is a breathtaking '*tour de force*,' consisting of 100 broadsides about type design in a wide variety of faces and styles. Superb as a source of inspiration and example.

Herman Zapf and His Design Philosophy by Herman Zapf, Introduction by Carl Zahn [New Haven: Yale University Press, 90 color plates]. While the Manuale shows the master at work, this volume is a discourse on Zapf's insights into type design. An excellent book.

Edward Johnson by Priscilla Johnson [New York: Pentallic, 1976]. Johnson's biography, written by his daughter, traces his career and influence. Unlike many printing books, this one is a delightful read.

Of the Just Shaping of Letters by Albrecht Dürer [New York: Dover Publications, 1965. (reprint of the Grolier Club translation of 1917)]. Originally part of Dürer's theoretical treatise on applied geometry, here is the source for those famous capital letters set against a gridded background.

Champ Fleury by Geoffrey Tory, translated into English and annotated by George B. Ives [New York: Dover Publications, 1967. (reprint of the Grolier Club translation of 1927)]. Similar to the Dürer book, but this is the one with the letters shown against naked human bodies in addition to the grid system.

Pioneers of modern typography by Herbert Spencer [Cambridge, Mass.: MIT Press, 1983. Rev. ed. 160 p. : ill.].

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Typeface Reference Works

Graphics master; a workbook of planning aids, reference guides, and graphic tools for the design, estimating, preparation, and production of printing, print advertising, and desktop publishing by Dean Phillip Lem [Los Angeles, Calif.: D. Lem Associates, 1988. 4th ed. 153 p. : ill. (some col.)]. Although it covers much more than just type design, and is fairly expensive, this is probably the most important and continually useful reference work that a desktop designer and/or publisher should have.

A.T.A. Type Comparison Book by Frank Merriman [Advertising Typographers Association of America, 1965]. An indispensable handbook for identifying typefaces. Hundreds of faces are grouped together by design, making it easy to find the one you want. Still in print, possibly in a more recent edition.

The Encyclopedia of Type Faces, 4th Edition by W. Pincus Jaspert, W. Turner Berry, and A. F. Johnson [Poole, Dorset: Blandford Press, 1983]. The standard reference in the field. A detailed listing of over 1,000 faces, arranged by name, with full information on their history, designers, etc.

The typEncyclopedia; a user's guide to better typography by Frank J Romano [New York: R.R. Bowker Co., 1984. xii, 188 p. : ill.].

Type and typography; the designer's type book by Ben Rosen [New York: Van Nostrand Reinhold Co., 1976 Rev. ed. 406 p. : ill.].

History of Printing

A Short History of the Printed Word by Warren Chappell [Boston: Nonpareil Books (David Godine), 1980]. A once-over-very-lightly in 240 pages of large type, hitting the highlights in the development of type, printing and bookmaking.

Five Hundred Years of Printing by S. H. Steinberg [Baltimore: Penguin Books, 1974]. A 400-page small-print paperback which is still in print, this covers Gutenberg through the early 20th century. Steinberg's style is a little dry. Since his death, the book (starting with the third edition) has been edited by James Moran.

The Making of Books by Seán Jennett [New York and Washington: Frederick A. Preager, 1967]. A good overview of the entire art and craft of the book, including a little history and a fairly detailed examination of every stage of the process. If you are interested in books in general, this is a good place to start. Out of print, but rather ubiquitous at second-hand and antiquarian dealers.

The Book: The Story of Printing & Bookmaking by Douglas C. McMurtrie [New York: Oxford University Press, 1943]. Almost 700 pages of large type devoted to the history of the book, by one of the most prolific writers in the field. Easy to read, anecdotal, and illustrated. Although out of print, it is not particularly scarce and, if you can find it, probably the quickest way to get up to speed on printing history.

Electronic Typography

The Macintosh Font Book by Erfert Fenton [Berkeley: Peachpit Press, 1989. 260 p]. Everything you want to know about Macintosh fonts and type faces, including type terminology, building a typeface library, font management, printing options, and a near-complete list of available Postscript typefaces (with vendor addresses) and typesetting service bureaus, as of mid-1989. It even includes a step-by-step guide to creating numeric fractions with Fontographer. The best all-around introduction to the world of Macintosh-specific font handling.

Macintosh desktop typography by John Baxter [Sunnyvale, CA, U.S.A.: Baxter Group, 1986 ill.]. A well done introduction to typography on the Macintosh, including useful suggestions about dealing with Postscript typefaces.

Design for desktop publishing: a guide to layout and typography on the personal computer by John Miles [San Francisco, CA: Chronicle Books, 1988].

Typography & typesetting: Type design and manipulation using today's technology by Ronald Labuz [New York: Van Nostrand Reinhold, 1988. 272 p. : ill. ; 29].

Digital typography: an introduction to type and composition for computer system design by Richard Rubinstein [Reading, MA: Addison-Wesley Pub. Co., 1988. xi, 340 p.: ill.].

Document manipulation and typography: proceedings of the International Conference on Electronic Publishing, Document Manipulation, and Typography, Nice (France), April 20-22, 1988 edited by J. C. van Vliet [Cambridge; New York: Cambridge University Press, 1988. 288 p].

Bibliographies

A Typological Tally compiled by Tony Appleton [Brighton, (T. Appleton, 28 Florence Rd., Brighton, Sussex BN1 6DJ), 1973. 94 p. ill.]. Thirteen hundred writings in English on printing history, typography, bookbinding, and papermaking, compiled by one of the world's top dealers in the field.

A Bibliography of Printing with Notes and Illustrations by F. C. Bigmore and C. W. H. Wyman [London: Oak Knoll Books, 1978]. Universally known as "Bigmore and Wyman," this is to printing bibliographies what Updike is to books about printing types. Published in 1880 (editions since then have been reprints) B&W provides excellent commentaries on just about every book that had been written on the subject as of the year it was published.

Book Dealers/Publishers Specializing in Typography and the Book Arts

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Glossary

AFM	(Adobe Font Metrics) A specification for storing font metrics information in a file (for example: character widths, kerning pairs, and bounding boxes).
ATM	(Adobe Type Manager) The program that improves your screen font display by eliminating jagged fonts for Type 1 fonts.
Ascent	A font's maximum distance above the baseline.
ASCII	(American Standard Code for Information Interchange) A numbering scheme used for printing characters.
Baseline	The line upon which the capital letters of a font rest.
Basepoint	Fontographer's reference point from which distances are measured, and about which the special effect transformations are performed.
BCP	Bézier Control Point.
Bézier control point	One of two points which guide a Bézier curve.
Bézier curve	A particular type of cubic spline curve defined to make it easy to join to other curves and straight lines with smooth tangent joins.
Bitmap font	A character set created by turning on or off individual dots in a rectangular array of dots.
Crosshair	The shape the pointer assumes when any of the drawing tools from Fontographer's tool palette are selected.
Demagnified move	A special capability of Fontographer which allows precise point adjustment without requiring a zoom-in.
Descent	A font's maximum distance below the baseline.
Discontiguous	Not adjacent to each other (as in discontiguous characters).

Downloadable font	A font that can be temporarily stored in the printer's memory.
Downloading	The process by which a PostScript font file is sent to a PostScript printer.
DPI	Dots Per Inch.
Em-square	A square the size of a capital letter "M." Also the height of the ascent added to the height of the descent.
Em-units	Dimensionless distance-measuring units used in Fontographer.
EPS Exchange	Altsys Corporation's utility which enables Aldus FreeHand artwork to be converted into Adobe Illustrator 88 or Adobe Illustrator 3.0 file format.
Flex	Applies subtle effects to cupped serifs and tapered stems.
Font attributes	Characteristics which apply to the font as a whole (such as the ascent, descent, leading, etc.).
Font	A particular size of a typeface.
FONT	Old font resource name (see NFNT).
Fontastic Plus	Altsys Corporation's specialized bitmap font editor.
Fontographer	Altsys Corporation's outline font editor designed to simplify the creation of high-quality fonts, logos, and other intricate PostScript artwork on the Apple Macintosh.
Hints	Proprietary algorithms which enhance the appearance of characters printed at low resolutions (150-600 dpi).
Kerning pairs	Combinations of characters where the space between them has been decreased to improve legibility.

Kerning	Manually moving letters either closer or farther apart to adjust and improve the space between them.
LaserWriter	Apple Computer's PostScript-compatible laser printer.
Leading	The space, measured from baseline to baseline, added between successive rows of text in a document.
Library	The ability to attach a font for use as a parts reference library.
Linotype 100/300	High-resolution typesetting systems.
Metamorphosis Professional	Altsys Corporation's utility designed to convert any PostScript or TrueType font into other font formats for the Macintosh and IBM-compatible PCs. Meta Pro can also convert PostScript fonts into NeXT font formats, as well as into editable PICT and EPS outline formats.
Metrics	Font information such as ascent, descent, leading, character width, and kerning.
Monospaced type	Type whose characters are all of the same width.
NFNT	Bitmap fonts' resources (New fonts).
Outline font	A font created by drawing the outlines of each character. A PostScript font is an outline font.
Path	A sequence of points which may be connected, unconnected, open, or closed.
Permanent font	A font which resides in the LaserWriter until the power is turned off.
Pica	A unit of typographic measurement equal to 0.166 inches or 12 points.
Point	A unit of typographic measurement equal to approximately 1/72 inch (0.1383 inches).
PostScript	Adobe System's page description language.

Printer font	A font (i.e., Helvetica and Times) that permanently resides in the printer.
Proportionately spaced type	Type whose character widths vary.
Sans serif	A typeface with no counterstrokes at the end of each stroke.
Screen font	Bitmap fonts used for Macintosh screen display.
Serif	A typeface with counterstrokes at the end of each stroke.
Spacing	Used to describe the amount of unused area that exists between characters.
Style Merger	Altsys Corporation's utility designed to merge styled fonts into one font family.
T-bar	An upside down "T" which is used in the metrics display area to adjust character width and kerning.
Tool palette	The collection of tools located along the left edge of a character edit window.
Transient font	A font which stays in the LaserWriter memory until the current document is finished being printed.
TrueType	Apple's outline font format designed to be used with their System 7 operating software and Microsoft Windows 3.x.
Type 1 font	Genuine Adobe PostScript fonts with hints, which provide high quality resolution at any size.
Type 3 font	Also referred to as user-defined fonts, are non-Adobe encrypted fonts. Does not render onscreen in ATM.
Typeface	A set of characters which share a similar appearance.
Weight	The measurement of a stroke's width.
x-height	The height of the lower case letters of a font, specifically the "x."

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